ĐẠI HỌC QUỐC GIA
THÀNH PHỐ HỒ CHÍ MINH
TRƯỜNG ĐẠI HỌC QUỐC TẾ

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

CHƯƠNG TRÌNH ĐÀO TẠO NGÀNH
KỸ THUẬT HỆ THỐNG CÔNG NGHIỆP TRÌNH ĐỘ ĐẠI HỌC

(Kèm theo Quyết định số / QĐ-ĐHQT ngày / / 2025
của Hiệu trưởng trường Đại học Quốc tế)

1. Thông tin chung

- Tên ngành đào tạo:
  + Tiếng Việt: Kỹ thuật Hệ thống Công nghiệp
  + Tiếng Anh: Industrial and Systems Engineering
- Mã ngành đào tạo: 7520118
- Trình độ đào tạo: Đại học
- Loại hình đào tạo: Chính Quy
- Thời gian đào tạo: 4.5 - 5 năm
- Tên văn bằng sau khi tốt nghiệp:
  + Tiếng Việt: Kỹ sư Kỹ thuật Hệ thống Công nghiệp
  + Tiếng Anh: Engineer in Industrial and Systems Engineering
- Nơi đào tạo: Trường Đại học Quốc Tế - ĐHQG HCM (ĐHQT)

2. Thông tin tuyển sinh và kế hoạch đào tạo

a. Đối tượng tuyển sinh

Đối tượng tuyển sinh căn cứ theo quy chế tuyển sinh đại học của Bộ Giáo dục và Đào tạo và Thông tin tuyển sinh hàng năm của Đại học Quốc gia TP.HCM và Thông tin tuyển sinh của trường Đại học Quốc tế.

b. Hình thức tuyển sinh

Trường Đại học Quốc tế thực hiện tuyển sinh theo Quy chế tuyển sinh Đại học ban hành hàng năm bởi Bộ Giáo dục và Đào tạo, căn cứ theo Thông tin tuyển sinh hàng năm của Đại học Quốc gia TP.HCM và Thông tin tuyển sinh của trường Đại học Quốc tế.

***c.* Nhóm ngành tuyển sinh:** Kỹ thuật

***d.* Tổ hợp môn xét tuyển:** Bao gồm ba tổ hợp môn xét tuyển:

+ Toán – Vật lí – Hóa học
+ Toán – Vật lí – Tiếng Anh
+ Toán – Hóa học – Sinh học
+ Toán – Hóa học – Tiếng Anh
+ Toán – Sinh học – Tiếng Anh
+ Toán – Ngữ văn – Tiếng Anh

e. Dự kiến chỉ tiêu tuyển sinh, quy mô đào tạo:

Năm	2025	2026	2027	2028	2029	2030
Tuyển sinh mới	100	100	100	100	100	100
Quy mô đào tạo	400	400	400	400	400	400

3. Mục tiêu đào tạo

a. Mục tiêu chung

Mục tiêu đào tạo của CTĐT	Tầm nhìn	Sứ mạng	Luật giáo dục
Ngành Kỹ thuật Hệ thống Công nghiệp đào tạo các kỹ sư cải tiến hệ thống sản xuất và dịch vụ, các chuyên viên hoạch định sản xuất, các kỹ sư quản lý và điều hành hệ thống sản xuất và dịch vụ, các kỹ sư quản lý chất lượng, quản lý dự án, và quản lý kho bãi, các kỹ sư phân tích và mô phỏng nhằm hoạch định và đưa ra các giải pháp tối ưu hoạt động của các hệ thống sản xuất và dịch vụ.	***Trường ĐHQT:*** + phấn đấu trở thành trường đại học **định hướng nghiên cứu hàng đầu** tại Việt Nam và châu Á + là cơ sở giáo dục ngang tầm **quốc tế, tự chủ, sáng tạo** + là nơi vun đắp và **phát triển nguồn nhân lực chất lượng cao** cho thị trường lao động trong nước và quốc tế.	***Trường ĐHQT:*** + **Giảng dạy và nghiên cứu thực hiện bằng tiếng Anh** là điểm khác biệt nâng tầm quốc tế của nhà trường. Người học được đào tạo và rèn luyện để trở thành **công dân toàn cầu và có trách nhiệm với xã hội**, dẫn dắt xã hội trong tương lai. + Nghiên cứu cơ bản với **hàm lượng tri thức lớn** song hành với **nghiên cứu ứng dụng**, đáp ứng yêu cầu **đổi mới sáng tạo** và **phát triển bền vững** của doanh nghiệp, địa phương và xã hội + quan tâm, thúc đẩy các hoạt động kết nối và phục vụ cộng đồng.	Mục tiêu giáo dục nhằm phát triển toàn diện con người Việt Nam có đạo đức, tri thức, văn hóa, sức khỏe, thẩm mỹ và nghề nghiệp; có phẩm chất, năng lực và ý thức công dân; có lòng yêu nước, tinh thần dân tộc, trung thành với lý tưởng độc lập dân tộc và chủ nghĩa xã hội; phát huy tiềm năng, khả năng sáng tạo của mỗi cá nhân; nâng cao dân trí, phát triển nguồn nhân lực, bồi dưỡng nhân tài, đáp ứng yêu cầu của sự nghiệp xây dựng, bảo vệ Tổ quốc và hội nhập quốc tế.
	Khoa KT&CLQN: + Khoa Kỹ thuật và Quản lý Công nghiệp (IEM) luôn hướng tới vai trò dẫn đầu trong giáo dục và nghiên cứu học thuật trong các lĩnh vực Kỹ thuật Hệ thống Công nghiệp (ISE) và	***Khoa KT&QLCN:*** + Cung cấp chương trình đào tạo đại học và sau đại học chất lượng cao + Thực hiện các nghiên cứu xuất sắc, bao gồm cả nghiên cứu cơ bản và ứng dụng, nhằm đáp ứng	

	Logistics và Quản lý Chuỗi Cung ứng (LSCM) tại Việt Nam.	nhu cầu của ngành công nghiệp, các địa phương và xã hội + Đóng vai trò tiên phong trong việc phát triển lĩnh vực Quản lý Công nghiệp và Hệ thống (IEM) tại Việt Nam thông qua việc thúc đẩy ứng dụng IEM vào nhiều lĩnh vực sản xuất và dịch vụ khác nhau trong nước	

b. Mục tiêu cụ thể (Program Objectives - POs)

Mục tiêu cụ thể của CTĐT được xác định từ mục tiêu chung, bao gồm 4 mục tiêu, trong đó có 1 mục tiêu về kiến thức, 2 mục tiêu về kỹ năng và 1 mục tiêu về tự chủ và trách nhiệm, được trình bày như sau:

- Kiến thức:
  - **PO#1.** Thực hành kỹ thuật trong lĩnh vực Kỹ thuật Hệ thống Công nghiệp
    (i) Thiết kế hoặc tái thiết kế các hệ thống sản xuất và dịch vụ
    (ii) Vận hành và quản lý các hệ thống sản xuất và dịch vụ
    (iii) Cải thiện các hệ thống sản xuất và dịch vụ hiện có
    (iv) Hỗ trợ ra quyết định trong các hệ thống sản xuất và dịch vụ
- Tự chủ và trách nhiệm:
  - **PO#2.** Học tập suốt đời để duy trì và nâng cao kỹ năng nghề nghiệp
- Kỹ năng:
  - **PO#3.** Làm việc hiệu quả với mọi người và thể hiện khả năng lãnh đạo, kỹ năng chuyên môn và hành vi đạo đức tại nơi làm việc
  - **PO#4.** Đáp ứng nhu cầu của cộng đồng và ngành hệ thống công nghiệp Việt Nam trong việc giải quyết các vấn đề của chuỗi cung ứng sử dụng những nguyên tắc, công cụ và kỹ thuật của kỹ thuật hệ thống

Các mục tiêu của chương trình Kỹ thuật Hệ thống Công nghiệp được xác định bởi giảng viên chương trình với sự tư vấn và phân tích về tầm nhìn và sứ mệnh của trường đại học và nhu cầu của các bên liên quan.

Do đó, PO#1 và PO#2 đáp ứng sứ mệnh đầu tiên của ĐHQT là cung cấp sinh viên tốt nghiệp chất lượng cao và giáo dục đại học đa ngành nói chung và trong lĩnh vực hậu cần và quản lý cung ứng chuỗi nói riêng. PO#1 và PO#4 cũng ngụ ý khả năng thực hiện nghiên cứu và phụng sự cộng đồng, xã hội là sứ mệnh thứ hai của trường đại học. PO#4 đóng góp thúc đẩy hệ thống công nghiệp trong nhiều lĩnh vực các ngành sản xuất và dịch vụ ở Việt Nam phù hợp với nhiệm vụ thứ ba của trường đại học [Trang web IU].

4. Chuẩn đầu ra của chương trình đào tạo (Program Learning Outcomes –PLOs)

Chuẩn đầu ra của chương trình đào tạo: được xác định từ các mục tiêu cụ thể. Chuẩn đầu ra bảo đảm đầy đủ theo quy định về chuẩn đầu ra theo các bậc/trình độ tương ứng tại phụ lục "Bảng mô tả Khung trình độ Quốc gia Việt Nam" kèm theo Quyết định số 1982/QĐ-TTg ngày 18 tháng 10 năm 2016 của Thủ tướng Chính phủ). Chuẩn đầu ra (CĐR) của chương trình được áp dụng theo tiêu chí ABET về Chuẩn đầu ra của sinh viên trong các chương trình kỹ thuật tổng quát theo 7 tiêu chí (1 đến 7).

CĐR	Nội dung CĐR	Trình độ năng lực
Kiến thức		
PLO1	Khả năng xác định, xây dựng và giải quyết các vấn đề kỹ thuật phức tạp bằng cách áp dụng các nguyên tắc kỹ thuật, khoa học và toán học	Apply – Analyze – Evaluate – Create
PLO2	Khả năng áp dụng thiết kế kỹ thuật để tạo ra các giải pháp đáp ứng các nhu cầu cụ thể có tính đến sức khỏe cộng đồng, an toàn và phúc lợi, cũng như các yếu tố toàn cầu, văn hóa, xã hội, môi trường và kinh tế	Apply – Analyze – Evaluate – Create
Tự chủ và trách nhiệm		
PLO3	Khả năng giao tiếp hiệu quả với nhiều đối tượng	Apply – Analyze – Evaluate
PLO4	Khả năng nhận ra các trách nhiệm đạo đức và nghề nghiệp trong các tình huống kỹ thuật và đưa ra những đánh giá sáng suốt, phải xem xét tác động của các giải pháp kỹ thuật trong bối cảnh toàn cầu, kinh tế, môi trường và xã hội	Apply – Analyze – Evaluate – Create
Kỹ năng		
PLO5	Khả năng hoạt động hiệu quả trong một nhóm mà các thành viên cùng nhau đóng vai trò lãnh đạo, tạo môi trường hợp tác và hòa nhập, thiết lập mục tiêu, lập kế hoạch nhiệm vụ và đạt được mục tiêu	Apply – Analyze – Evaluate – Create
PLO6	Khả năng phát triển và tiến hành thử nghiệm phù hợp, phân tích và diễn giải dữ liệu, và sử dụng phán đoán kỹ thuật để đưa ra kết luận	Apply – Analyze – Evaluate
PLO7	Khả năng tiếp thu và áp dụng kiến thức mới khi cần thiết, sử dụng các chiến lược học tập phù hợp	Apply – Analyze – Evaluate

*Trình độ năng lực theo thang Bloom

5. Ma trận giữa mục tiêu đào tạo và chuẩn đầu ra

CĐR sẽ gắn kết với mục tiêu cụ thể đã được xác định ở Mục 3, theo Bảng 2.

Bảng 2. Mối quan hệ giữa CĐR của CTĐT và mục tiêu đào tạo

	PLOs	POs			
		PO#1	PO#2	PO#3	PO#4
Kiến thức	PLO1	x			
	PLO2	x			x
Tự chủ và trách nhiệm	PLO3		x	x	
	PLO4		x		x
Kỹ năng	PLO5			x	x
	PLO6			x	x
	PLO7			x	x

(1)Cột PLOs: Thầy/Cô xác định các CĐR tương ứng với các khối kiến thức, kỹ năng, tự chủ và trách nhiệm.
(2)Cột POs: Thầy/Cô cung cấp các mục tiêu đào tạo cụ thể mà đã được trình bày ở Mục 3
Trong Bảng 2, cần xác định mối liên quan bằng cách đặt dấu "X"

6. Quy trình đào tạo, điều kiện tốt nghiệp

Căn cứ Quyết định số 1342/QĐ-ĐHQG ngày 30 tháng 9 năm 2022 của Giám đốc Đại học Quốc gia Thành phố Hồ Chí Minh về việc ban hành Quy chế đào tạo trình độ đại học.
Căn cứ Quyết định số 719/QĐ-ĐHQT ngày 06 tháng 12 năm 2021 của Hiệu trưởng trường Đại học Quốc tế về việc ban hành Quy chế đào tạo trình độ đại học theo hệ thống tín chỉ tại trường Đại học Quốc tế.

7. Thang điểm (theo thang điểm chính thức của trường)

Trường quy định thang điểm đánh giá kết quả học tập của người học (Quy chế đào tạo trình độ đại học theo hệ thống tín chỉ tại trường Đại học Quốc tế)

Bảng 3: Thang điểm

Xếp loại	Thang điểm 100	Thang điểm 4	Thang điểm chữ
Đạt			
Xuất sắc	90≤ ĐTBTL ≤ 100	4,0	A+
Giỏi	80≤ ĐTBTL < 90	3,5	A
Khá	70≤ ĐTBTL < 80	3,0	B+
Trung bình khá	60≤ ĐTBTL < 70	2,5	B
Trung bình	50≤ ĐTBTL < 60	2,0	C
Không đạt			
Yếu	40 ≤ ĐTBTL < 50	1,5	D+

Kém	30 ≤ ĐTBTL < 40	1,0	D
	ĐTBTL < 30	0,0	F

8. Khối lượng kiến thức toàn khóa

Tổng số tín chỉ: 150 tín chỉ, trong đó phân bổ kiến thức như Bảng 4 (không bao gồm giáo dục thể chất và giáo dục quốc phòng):

Bảng 4. Cấu trúc chương trình đào tạo

TT	Các khối kiến thức[3]	Khối lượng			
		Số tín chỉ			Tỉ lệ % *(Tổng khối kiến thức/ Tổng số tín chỉ)*
		Tổng	Lý thuyết	Thực hành	
I	**Khối kiến thức giáo dục đại cương**	**42**	**42**	**0**	**28.00**
	- Bắt buộc: 42 tín chỉ	42	42	0	
	- Tự chọn: 0 tín chỉ	0	0	0	
II	**Khối kiến thức cơ sở ngành**	**19**	**15**	**4**	**12.67**
	- Bắt buộc: 19 tín chỉ	19	15	4	
	- Tự chọn: 0 tín chỉ	0	0	0	
III	**Kiến thức chuyên ngành**	**71**	**67**	**4**	**47.33**
	- Bắt buộc: 47 tín chỉ	47	43	4	31.33
	- Tự chọn: 24 tín chỉ	24	24	0	16.00
IV	**Kiến thức bổ trợ**	**0**	**0**	**0**	**0**
	- Bắt buộc: 0 tín chỉ	0	0	0	
	- Tự chọn: 0 tín chỉ	0	0	0	
V	**Thực tập, khóa luận/luận văn tốt nghiệp**	**18**	**18**	**0**	**12.00**
	Tổng cộng	150	142	8	100

9. Nội dung chương trình đào tạo

Bảng 5: Khung CTĐT chung của nhóm ngành kỹ thuật

STT	Mã MH	Tên MH		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Phòng TN
		Tiếng Việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/ Thí nghiệm	
I	**Kiến thức giáo dục đại cương**				38	32	6	
I.1	**Lý luận Chính trị**							

1	PE015IU	Triết học Mác-Lênin	Philosophy of Marxism and Leninism	Bắt buộc	3	3	0	
2	PE016IU	Kinh tế chính trị Mác-Lênin	Political Economics of Marxism and Leninism	Bắt buộc	2	2	0	
3	PE017IU	Chủ nghĩa xã hội khoa học	Scientific Socialism	Bắt buộc	2	2	0	
4	PE018IU	Lịch sử Đảng Cộng sản Việt Nam	History of Vietnamese Communist Party	Bắt buộc	2	2	0	
5	PE019IU	Tư tưởng Hồ Chí Minh	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0	
I.2	**Toán-Tin-Khoa học Tự nhiên**							
6	MA001IU	Toán 1	Calculus 1	Bắt buộc	4	4	0	
7	MA003IU	Toán 2	Calculus 2	Bắt buộc	4	4	0	
8	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
I.3	**Khoa học xã hội- Nhân văn – Nghệ thuật**							
9	PE021IU	Pháp luật đại cương	General Law	Bắt buộc	3	3	0	
I.4	**Ngoại ngữ**							
10	EN007IU	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Writing AE1	Bắt buộc	2	2	0	
11	EN008IU	Tiếng Anh chuyên ngành 1 (kỹ năng	Listening AE1	Bắt buộc	2	2	0	

		nghe)						
12	EN011IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Writing AE2	Bắt buộc	2	2	0	
13	EN012IU	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Speaking AE2	Bắt buộc	2	2	0	
I.5	**Giáo dục thể chất**							
14	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3	0	3	
15	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3	0	3	

Bảng 6: Các môn học thuộc CTĐT ngành Kỹ thuật Hệ thống công nghiệp khóa 2025

Stt	Mã MH	Tên môn học (MH)		Loại MH (bắt buộc/ tự chọn)	Tín chỉ			Phòng TN (**)
		Tiếng Anh	Tiếng Việt		Tổng cộng	Lý thuyết	Thực hành/ Thí nghiệm	
I	**Kiến thức giáo dục đại cương**				**42**	**42**	**0**	
1	PE015IU	Philosophy of Marxism and Leninism	Triết học Mác-Lênin	Bắt buộc	3	3	0	
2	PE016IU	Political economics of Marxism and Leninism	Kinh tế chính trị Mác-Lênin	Bắt buộc	2	2	0	
3	PE017IU	Scientific Socialism	Chủ nghĩa xã hội khoa học	Bắt buộc	2	2	0	
4	PE018IU	History of the Communist Party of Vietnam	Lịch sử Đảng Cộng Sản Việt Nam	Bắt buộc	2	2	0	

5	PE019IU	HCM' s Thoughts	Tư tưởng Hồ Chí Minh	Bắt buộc	2	2	0	
6	EN007IU	Writing AE1	Tiếng Anh chuyên ngành 1 – Viết	Bắt buộc	2	0	0	
7	EN008IU	Listening AE1	Tiếng Anh chuyên ngành 1 – Nghe	Bắt buộc	2	0	0	
8	EN011IU	Writing AE2	Tiếng Anh chuyên ngành 2 – Viết	Bắt buộc	2	0	0	
9	EN012IU	Speaking AE2	Tiếng Anh chuyên ngành 2 – Nói	Bắt buộc	2	0	0	
10	MA001IU	Calculus 1	Giải tích 1	Bắt buộc	4	4	0	
11	MA003IU	Calculus 2	Giải tích 2	Bắt buộc	4	4	0	
12	PH013IU	Physics 1	Vật lý 1	Bắt buộc	2	2	0	
13	PH014IU	Physics 2	Vật lý 2	Bắt buộc	2	2	0	
14	CH011IU	Chemistry for Engineers	Hóa cơ bản	Bắt buộc	3	3	0	
15	PE021IU	General Law	Pháp luật đại cương	Bắt buộc	3	3	0	
16	PT001IU	Physical Training 1	Giáo dục thể chất 1	Bắt buộc				
17	PT002IU	Physical Training 2	Giáo dục thể chất 2	Bắt buộc				
18	MA027IU	Applied Linear Algebra	Đại số tuyến tính ứng dụng	Bắt buộc	2	2	0	
19	PE022IU	Engineering Ethics and Critical Thinking	Đạo đức kỹ thuật và tư duy phân tích	Bắt buộc	3	3	0	
II	**Kiến thức cơ sở ngành**				**19**	**15**	**4**	

20	IS115 IU	Introduction to Computing	Tin học cho kỹ sư	Bắt buộc	3	2	1	LA.613, LA.614
21	IS112 IU	Engineering Probability & Statistics	Xác suất thống kê cho kỹ thuật	Bắt buộc	4	3	1	LA.614
22	IS020 IU	Engineering Economy	Kinh tế kỹ thuật	Bắt buộc	3	3	0	
23	IS102 IU	Engineering Drawing	Vẽ kỹ thuật	Bắt buộc	2	2	0	
24	IS085 IU	CAD/CAM/ CNC	CAD/CAM/ CNC	Bắt buộc	3	2	1	LA.614
25	IS019 IU	Production Management	Quản lý sản xuất	Bắt buộc	3	3	0	
26	IS001 IU	Introduction to Industrial Engineering	Giới thiệu ngành Kỹ thuật Hệ thống Công nghiệp	Bắt buộc	1	0	1	LA.613, LA.614, LA.105, LA.107
III	**Kiến thức chuyên ngành**							
III .1	**Kiến thức chuyên ngành bắt buộc**				**47**	**45**	**2**	
27	IS103 IU	Deterministic Models in OR	Vận trù học 1 - Các mô hình tất định	Bắt buộc	3	3	0	
28	IS017 IU	Work Design & Ergonomics	Đo lường lao động & Thiết kế công việc	Bắt buộc	4	3	1	LA2.105, LA2.107
29	IS034 IU	Product Design & Development	Thiết kế & Phát triển sản phẩm	Bắt buộc	3	3	0	
30	IS028 IU	Simulation Models in Industrial Engineering	Mô hình hóa và mô phỏng	Bắt buộc	4	3	1	LA2.613, LA2.614
31	IS027 IU	Scheduling & Sequencing	Kỹ thuật điều độ trong sản xuất và dịch vụ	Bắt buộc	3	3	0	

32	IS023 IU	Inventory Management	Quản lý vật tư tồn kho	Bắt buộc	3	3	0	
33	IS091 IU	Management Information Systems with ERP Applications	Hệ thống thông tin quản lý với ứng dụng ERP	Bắt buộc	3	3	0	
34	IS041 IU	Lean Production	Hệ thống Sản xuất tinh gọn	Bắt buộc	3	3	0	
35	IS025 IU	Quality Management	Quản lý chất lượng	Bắt buộc	3	3	0	
36	IS026 IU	Project Management	Quản lý dự án	Bắt buộc	3	3	0	
37	IS058 IU	Time Series & Forecasting Techniques	Kỹ thuật dự báo	Bắt buộc	3	3	0	
38	IS031 IU	Experimental Design	Thiết kế thực nghiệm	Bắt buộc	3	3	0	
39	IS033 IU	Multi-Criteria Decision Making	Kỹ thuật ra quyết định đa mục tiêu	Bắt buộc	3	3	0	
40	IS032 IU	Facility Layout	Thiết kế mặt bằng hệ thống công nghiệp	Bắt buộc	3	3	0	
41	IS096 IU	Advanced Industrial Big Data Analytics and AI Applications for Industry and Supply Chain	Phân tích nâng cao dữ liệu lớn trong thương mại và công nghiệp	Bắt buộc	3	3	0	
III .2	**Kiến thức chuyên ngành tự chọn 1 (chọn 1 trong các môn sau)**				**3**	**3**	**0**	
42	IS024 IU	Probabilistic Models in OR	Các môn hình bất định trong nghiên cứu vận hành	Tự chọn	3	3	0	

43	IS087 IU	Manufacturing Processes	Các quá trình sản xuất	Tự chọn	3	3	0	
44	IS092 IU	Data Collection, Analysis and Applications	Phân tích, thu thập số liệu và ứng dụng	Tự chọn	3	3	0	
45	IS105 IU	Cold Chain Systems	Hệ thống chuỗi cung ứng lạnh	Tự chọn	3	3	0	
46	IS113 IU	Engineering Computing Skills	Kỹ năng Tính toán dành cho ngành Kỹ thuật	Tự chọn	3	3	0	
III .3	**Kiến thức chuyên ngành tự chọn 2 (chọn 2 trong các môn sau)**				**6**	**6**	**0**	
47	IS114 IU	Scientific Research Writing	Tiếng Anh nghiên cứu học thuật	Tự chọn	3	3	0	
48	IS095 IU	Industrial Intelligent Systems	Hệ thống công nghiệp thông minh	Tự chọn	3	3	0	
49	IS099 IU	Industrial & Commercial Data Systems	Hệ thống dữ liệu trong thương mại và công nghiệp	Tự chọn	3	3	0	
50	IS106 IU	E-commerce Systems	Hệ thống thương mại điện tử	Tự chọn	3	3	0	
51	IS093 IU	Predictive Data Analytics and Applications	Phân tích dữ liệu dự đoán và ứng dụng	Tự chọn	3	3	0	
III .4	**Kiến thức chuyên ngành tự chọn 3 (chọn 2 trong các môn sau)**				**6**	**6**	**0**	
52	IS097 IU	Smart Manufacturing Systems	Các hệ thống sản xuất thông minh	Tự chọn	3	3	0	
53	IS100 IU	Decision Analytics	Phân tích quyết định	Tự chọn	3	3	0	

54	IS035 IU	Systems Engineering	Kỹ thuật Hệ thống	Tự chọn	3	3	0	
55	IS067 IU	International Transportation & Logistics	Vận chuyển quốc tế	Tự chọn	3	3	0	
56	IS062 IU	E-Logistics in Supply Chain Management	Thương mại điện tử trong Logistics và Chuỗi cung ứng	Tự chọn	3	3	0	
57	IS045 IU	Leadership	Kỹ năng lãnh đạo	Tự chọn	3	3	0	
III .5	**Kiến thức chuyên ngành tự chọn 4 (chọn 1 trong các môn sau)**				**6**	**6**	**0**	
58	IS043 IU	Flexible Manufacturing Systems	Hệ thống sản xuất linh hoạt	Tự chọn	3	3	0	
59	IS098 IU	Advanced Modeling & Prototyping	Mô hình hóa và tạo mẫu nâng cao	Tự chọn	3	3	0	
60	IS101 IU	Industrial Process, System Data Analysis and Modelling	Phân tích, mô hình hóa dữ liệu hệ thống và quy trình công nghiệp	Tự chọn	3	3	0	
61	IS082 IU	Retail Management	Quản lý bán lẻ	Tự chọn	3	3	0	
62	IS066 IU	Data Mining In Supply Chain	Khai phá dữ liệu trong chuỗi cung ứng	Tự chọn	3	3	0	
III .6	**Kiến thức chuyên ngành tự chọn tự do (chọn 1 trong các môn tự chọn ngoài ngành theo bảng các môn học tự chọn bên dưới)**				**3**	**3**	**0**	
IV	**Thực tập, khóa luận/luận văn tốt nghiệp**				**18**	**18**	**0**	
63	IS052 IU	Internship 1	Thực tập 1	Bắt buộc	2	2	0	

64	IS053 IU	Internship 2	Thực tập 2	Bắt buộc	3	3	0	
65	IS083 IU	Capstone Design	Thiết kế đồ án	Bắt buộc	3	3	0	
66	IS048 IU	Thesis	Luận văn tốt nghiệp	Bắt buộc	10	10	0	
	Tổng số (tín chỉ)				**150**	**142**	**8**	

Bảng các môn kiến thức chuyên ngành tự chọn tự do

No.	Courses code	Courses	Credits
1	BA130IU	Organizational Behavior	3
2	BA032IU	Sales Management	3
3	BA003IU	Principles Of Marketing	3
4	BA156IU	Human Resources Management	3
5	BA115IU	Introduction to Business Administration	3
6	BA117IU	Introduction to Microeconomics	3
7	BA123IU	Principles of Management	3
8	BA119IU	Introduction to Macroeconomics	3
9	BA118IU	Introduction to Psychology	3
10	BA197IU	Introduction to Sociology	3
11	IT011UN	Functional Programming	3
12	IT120IU	Entrepreneurship	3
13	IT007UN	Skills for Communicating Information	3
14	IT151IU	Statistical Methods	3
15	BM033IU	Information Technology in the Healthcare System	3
16	ENEE2001IU	Introduction to Environmental Engineering	3
17	ENEE2008IU	Environmental Ecology	3
18	CHE2041IU	Mass Transfer Operations	3
19	MAFE105IU	Financial Economics	3
20	MAFE215IU	Financial Management	3
21	MAFE209IU	Financial markets	3
22	MAFE207IU	Decision Making	3
23	MAFE308IU	Financial Risk Management 1	3
24	MAFE402IU	Portfolio Management	3
25	PH027IU	Earth Observation and The Environment	3
26	PH047IU	Navigation Systems	3

27	PH046IU	Geographic Information Systems (GIS) and Spatial Analysis	3
28	CE505IU	Geotechnics	3
29	EE049IU	Introduction to Electrical Engineering	3

10. Dự kiến kế hoạch giảng dạy *(phân bổ các môn học theo từng học kỳ)* (tham khảo)

Bảng 7: Kế hoạch giảng dạy theo từng học kỳ (tham khảo)

Học kỳ	Mã MH	Tên MH		Loại MH (bắt buộc/ tự chọn)	Tín chỉ			Môn học tiên quyết/ Môn học học trước/ Môn học song hành
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành	
I (16 tín chỉ)	PE015IU	Triết học Mác Lênin	Philosophy of Marxism and Leninism	Bắt buộc	3	3	0	
	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3	3	0	
	MA001IU	Giải tích 1	Calculus 1	Bắt buộc	4	4	0	
	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	EN007IU	Tiếng Anh chuyên ngành 1 - Viết	Writing AE1	Bắt buộc	2	2	0	
	EN008IU	Tiếng Anh chuyên ngành 1 - Nghe	Listening AE1	Bắt buộc	2	2	0	
	PE021IU	Pháp luật đại cương	General Law	Bắt buộc	3	3	0	
			Tổng cộng		**19**	**19**	**0**	
II (17 tín chỉ)	PE017IU	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	
	PE022IU	Đạo đức kỹ sư và tư duy phân tích	Engineering Ethics and Critical Thinking	Bắt buộc	3	3	0	
	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3	3	0	
	MA003IU	Giải tích 2	Calculus 2	Bắt buộc	4	4	0	TQ: MA001IU - Calculus 1
	IS001IU	Giới thiệu ngành Kỹ thuật hệ thống công nghiệp	Introduction to Industrial Engineering	Bắt buộc	1	0	1	

	EN011IU	Tiếng Anh chuyên ngành 2 - Viết	Writing AE2	Bắt buộc	2	2	0	TQ: EN007IU - Listening AE1
	EN012IU	Tiếng Anh chuyên ngành 2 - Nói	Speaking AE2	Bắt buộc	2	2	0	TQ: EN008IU - Writing AE1
			Tổng cộng		**17**	**16**	**1**	
III (16 tín chỉ)	MA027IU	Đại số tuyến tính ứng dụng	Applied Linear Algebra	Bắt buộc	2	2	0	
	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	
	PE016IU	Kinh tế chính trị Mác- Lênin	Political economics of Marxism and Leninism	Bắt buộc	2	2	0	
	CH011IU	Hóa cơ bản	Chemistry for Engineers	Bắt buộc	3	3	0	
	IS019IU	Quản lý sản xuất	Production Management	Bắt buộc	3	3	0	
	IS112IU	Xác suất thống kê cho kỹ thuật	Engineering probability and statistics	Bắt buộc	4	3	1	
	IS115IU	Tin học cho kỹ sư	Introduction to Computing	Bắt buộc	3	3	0	
	IS102IU	Vẽ kỹ thuật	Engineering Drawing	Bắt buộc	2	2	0	
			Tổng cộng		**21**	**20**	**1**	
IV (16 tín chỉ)	IS020IU	Kinh tế kỹ thuật	Engineering Economy	Bắt buộc	3	3	0	
	PE018IU	Lịch sử Đảng cộng sản Việt Nam	History of the Communist Party of Vietnam	Bắt buộc	2	2	0	TQ: PE017IU - Scientific socialism
	IS103IU	Vận trù học 1 – Các mô hình tất định	Deterministic Models in Operation Research	Bắt buộc	3	3	0	TQ: IS112IU - Probability & Statistics for Engineers
	IS017IU	Đo lường lao động và Thiết kế công việc	Work design & Ergonomics	Bắt buộc	4	3	1	

	IS034IU	Thiết kế và phát triển sản phẩm	Product Design & Development	Bắt buộc	3	3	0	HT: IS102IU - Engineering Drawing
	IS085IU	CAD/CAM/CNC	CAD/CAM/CNC	Bắt buộc	3	3	0	HT: IS102IU - Engineering Drawing
			Tổng cộng		**18**	**17**	**1**	
Hè (2 tín chỉ)	IS052IU	Thực tập 1	Internship 1	Bắt buộc	2	2	0	
	MP001IU	Quân sự	Military Training	Bắt buộc				
			Tổng cộng		**2**	**2**	**0**	
V (18 tín chỉ)	IS091IU	Hệ thống thông tin quản lý với ứng dụng ERP	Management Information Systems with ERP Applications	Bắt buộc	3	3	0	
	IS023IU	Quản lý tồn kho	Inventory Management	Bắt buộc	3	3	0	HT: IS019IU - Production Management
	IS058IU	Kỹ thuật dự báo	Time series & Forecasting Technique	Bắt buộc	3	3	0	HT: IS019IU - Production Management
	IS041IU	Sản xuất tinh gọn	Lean Production	Bắt buộc	3	3	0	HT: IS019IU - Production Management
	IS031IU	Thiết kế thực nghiệm	Experimental Design	Bắt buộc	3	3	0	HT: IS112IU - Probability & Statistics for Engineers
	Môn tự chọn bắt buộc 1 (chọn 1 môn)				3	3	0	
	IS087IU	Các quá trình sản xuất	Manufacturing Processes	Tự chọn	3	3	0	
	IS092IU	Phân tích, thu thập số liệu và ứng dụng	Data Collection, Analysis and Applications	Tự chọn	3	3	0	HT: IS112IU - Probability & Statistics for Engineers

	IS024IU	Các môn hình bất định trong nghiên cứu vận hành	Probabilistic Models in OR	Tự chọn	3	3	0	HT: IS112IU - Probability & Statistics for Engineers
	IS105IU	Hệ thống chuỗi cung ứng lạnh	Cold Chain Systems	Tự chọn	3	3	0	
	IS113IU	Kỹ năng Tính toán dành cho ngành Kỹ thuật	Engineering Computing Skills	Tự chọn	3	3	0	
			Tổng cộng		**18**	**18**	**0**	
VI (16 tín chỉ)	IS027IU	Kỹ thuật điều độ trong sản xuất và dịch vụ	Scheduling & Sequencing	Bắt buộc	3	3	0	HT: IS019IU - Production Management
	IS028IU	Mô hình hóa và mô phỏng	Simulation Models in IE	Bắt buộc	4	3	1	HT: IS112IU - Probability & Statistics for Engineers
	IS096IU	Phân tích nâng cao dữ liệu trong thương mại và công nghiệp	Advanced Industrial Big Data Analytics and AI Applications for Industry and Supply Chain	Bắt buộc	3	3	0	HT: IS112IU - Probability & Statistics for Engineers
	PE019IU	Tư tưởng Hồ Chí Minh	Ho Chi Minh'sThought s	Bắt buộc	2	2	0	TQ: PE017IU - Scientific socialism
	Môn tự chọn bắt buộc 2 (chọn 2 môn)				6	6	0	
	IS114IU	Tiếng Anh học thuật	Scientific Research Writing	Tự chọn	3	3	0	
	IS095IU	Hệ thống công nghiệp thông minh	Industrial Intelligent Systems	Tự chọn	3	3	0	
	IS099IU	Hệ thống dữ liệu trong thương mại và công nghiệp	Industrial & Commercial Data Systems	Tự chọn	3	3	0	

	IS106IU	Hệ thống thương mại điện tử	E-Commerce Systems	Tự chọn	3	3	0	
	IS093IU	Phân tích dữ liệu dự đoán và ứng dụng	Predictive Data Analytics and Applications	Tự chọn	3	3	0	
			Tổng cộng		**16**	**15**	**1**	
Hè (3 tín chỉ)	IS053IU	*Sinh viên bắt đầu đăng ký* Thực tập 2	*Students can start registering* Internship 2	Bắt buộc	3	3	0	
			Tổng cộng		**3**	**3**	**0**	
VII (15 tín chỉ)	IS033IU	Kỹ thuật ra quyết định đa mục tiêu	Multi-Criteria Decision Making	Bắt buộc	3	3	0	HT: IS103IU - Deterministic models in OR
	IS025IU	Quản lý chất lượng	Quality Management		3	3	0	HT: IS112IU - Probability & Statistics for Engineers
	IS032IU	Thiết kế mặt bằng hệ thống công nghiệp	Facility Layout	Bắt buộc	3	3	0	
	Môn tự chọn bắt buộc 3 (chọn 2 môn)				6	6	0	
	IS097IU	Các hệ thống sản xuất thông minh	Smart Manufacturing Systems	Tự chọn	3	3	0	
	IS100IU	Phân tích quyết định	Decision Analytics	Tự chọn	3	3	0	
	IS035IU	Kỹ thuật Hệ thống	Systems Engineering	Tự chọn	3	3	0	
	IS067IU	Vận chuyển quốc tế	International transportation & Logistics	Tự chọn	3	3	0	
	IS062IU	Thương mại điện tử trong logistics và Chuỗi cung ứng	E- Logistics in Supply chain Management	Tự chọn	3	3	0	

	IS045IU	Kỹ năng lãnh đạo	Leadership	Tự chọn	3	3	0	
			Tổng cộng		**15**	**15**	**0**	
VIII (15 tín chỉ)	IS083IU	Đồ án môn học	Capstone Design	Bắt buộc	3	3	0	
	IS026IU	Quản lý dự án	Project Management	Bắt buộc	3	3	0	
	Môn tự chọn bắt buộc 4 (chọn 2 môn)				6	6	0	
	IS043IU	Hệ thống sản xuất linh hoạt	Flexible Manufacturing Systems	Tự chọn	3	3	0	
	IS098IU	Mô hình hóa và tạo mẫu nâng cao	Advanced Modeling & Prototyping	Tự chọn	3	3	0	
	IS101IU	Phân tích, mô hình hóa dữ liệu hệ thống và quy trình công nghiệp	Industrial Process, System Data Analysis and Modelling	Tự chọn	3	3	0	
	IS082IU	Quản lý bán lẻ	Retail Management	Tự chọn	3	3	0	
	IS066IU	Khai phá dữ liệu trong chuỗi cung ứng	Data Mining In Supply Chain	Tự chọn	3	3	0	
	Môn tự chọn tự do 5 (chọn 1 môn)				3	3	0	
			Tổng cộng		**15**	**15**	**0**	
			Tổng cộng		**3**	**3**	**0**	
IX (10 tín chỉ)	IS048IU	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	10	0	
			Tổng cộng		**10**	**10**	**0**	
	TỔNG SỐ TÍN CHỈ CHƯƠNG TRÌNH				**150**	**146**	**4**	

11. Ma trận các môn học và chuẩn đầu ra (kỹ năng)

(Danh sách các môn học được hệ thống theo học kỳ và phân bổ giảng dạy các kỹ năng vào các môn học: mức độ giảng dạy và trình độ năng lực yêu cầu với môn học theo trình độ năng lực. Thang đo năng lực Thầy/Cô cần xác định rõ, phù hợp với CTĐT của Thầy/Cô, khuyến khích sử dụng thang Bloom)

(Danh sách các môn học được hệ thống theo học kỳ và phân bổ giảng dạy các kỹ năng vào các môn học: mức độ giảng dạy I, T, U và trình độ năng lực yêu cầu với môn học theo trình độ năng lực)

	Courses code	Courses	Credits	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7
Semester 1 (min 5TC - max 20 TC)										
1	PE015IU	Philosophy of Marxism and Leninism	**3**			X	X			
2	PT001IU	Physical Training 1	**3**					X		X
3	MA001IU	Calculus 1	**4**	X					X	X
4	PH013IU	Physics 1	**2**	X					X	X
5	EN007IU	Writing AE1	**2**							X
6	EN008IU	Listening AE1	**2**							X
7	PE021IU	General Law	**3**			X	X			
		Total credits	**19**							
Semester 2 (18TC - 20TC)										
8	PE017IU	Scientific Socialism	**2**			X	X			
9	PE022IU	Engineering Ethics and Critical Thinking	**3**			X		X		X
10	PT002IU	Physical Training 2	**3**					X		X
11	MA003IU	Calculus 2	**4**	X					X	X
12	IS001IU	Introduction to Industrial Engineering	**1**			X		X		X
13	EN011IU	Writing AE2	**2**							X
14	EN012IU	Speaking AE2	**2**							X
		Total credits	**17**							
Semester 3										
15	MA027IU	Applied Linear Algebra	**2**	X					X	X
16	PH014IU	Physics 2	**2**	X					X	X
17	PE016IU	Political economics of Marxism and Leninism	**2**			X	X			
18	IS019IU	Production Management	**3**		X		X		X	
19	CH011IU	Chemistry for Engineers	**3**	X					X	X
20	IS112IU	Engineering Probability & Statistics	**4**	X					X	
21	IS115IU	Introduction to Computing	**3**	X	X				X	

22	IS102IU	Engineering Drawing	**2**	X					X	X
		Total credits	**20**							
Semester 4										
23	IS020IU	Engineering Economy	**3**		X		X		X	
24	PE018IU	History of the Communist Party of Vietnam	**2**				X		X	X
25	IS103IU	Deterministic Models in OR	**3**	X	X				X	
26	IS017IU	Work design & Ergonomics	**4**	X	X			X	X	
27	IS034IU	Product Design & Development	**3**		X	X	X	X		
28	IS085IU	CAD/CAM/CNC	**3**	X					X	X
		Total credits	**18**							
Summer semester 2										
29	IS052IU	Internship 1		X	X	X	X		X	X
30	MP001IU	Military Training								
		Total credits								
Semester 5										
31	IS091IU	Management Information System with ERP Applications	**3**			X	X	X		
32	IS023IU	Inventory Management	**3**	X	X	X	X	X	X	X
33	IS058IU	Time Series & Forecasting Techniques	**3**	X					X	X
34	IS041IU	Lean Production	**3**	X				X	X	X
35	IS031IU	Experimental Design	**3**						X	
36	IS___IU	Nhóm tự chọn số 01 - ISE Elective Course (choose 1 course below)	**3**							
	IS087IU	Manufacturing Processes	**3**	X					X	X
	IS092IU	Data Collection, Analysis, and Applications	**3**	X	X	X	X	X	X	
	IS024IU	Probabilistic Models in OR	**3**	X						X
	IS105IU	Cold Chain Systems	**3**	X	X	X		X		
	IS113IU	Engineering Computing Skills	**3**	X	X					X
		Total credits	**18**							
Semester 6										
37	IS027IU	Scheduling & Sequencing	**3**	X					X	
38	IS028IU	Simulation Models in IE	**4**	X	X				X	X
39	IS096IU	Advanced Industrial Big Data Analytics and AI Applications for Industry and Supply Chain	**3**	X	X	X	X	X	X	

40	PE019IU	HCM's Thoughts								
41	IS___IU	Nhóm tự chọn số 02 - ISE Elective Course (choose 2 course below)	**6**							
	IS114IU	Scientific Research Writing		X		X3	X			
	IS095IU	Industrial Intelligent Systems	**3**	X	X	X	X	X	X	
	IS099IU	Industrial & Commercial Data Systems	**3**	X	X	X	X	X	X	
	IS106IU	E-Commerce Systems	**3**	X	X	X	X	X	X	X
	IS093IU	Predictive data analytics and Applications	**3**	X	X	X	X	X	X	
		Total credits	**18**							
Summer semester 3										
42	IS053IU	Students can start registering Internship 2	**3**	X			X		X	X
		Total credits	**2**							
Semester 7										
43	IS033IU	Multi-Criteria Decision Making	**3**	X	X				X	
44	IS025IU	Quality Management	**3**	X	X	X	X		X	X
45	IS032IU	Facility Layout	**3**	X	X				X	
46	IS___IU	Nhóm tự chọn số 3 - ISE Elective Course (choose 2 courses below)	**6**							
	IS097IU	Smart Manufacturing Systems	**3**	X	X	X	X	X	X	
	IS100IU	Decision Analytics	**3**	X	X	X	X	X	X	X
	IS035IU	Systems Engineering	**3**				X	X	X	
	IS067IU	International Transportation & Logistics	**3**	X	X			X	X	
	IS062IU	E-Logistics in Supply Chain Management	**3**	X	X	X	X	X	X	X
	IS045IU	Leadership	**3**					X		
		Total credits	**15**							
Semester 8										
47	IS083IU	Capstone Design	**3**	X	X	X	X	X	X	X
48	IS026IU	Project Management	**3**		X		X		X	
49	IS___IU	Nhóm tự chọn số 04 - ISE Elective Course (choose 2 courses below)	**6**							
	IS043IU	Flexible Manufacturing Systems	**3**			X	X	X		

	IS098IU	Advanced Modeling & Prototyping	**3**	X	X	X	X	X	X	
	IS101IU	Industrial Process, System Data Analysis and Modelling	**3**	X	X	X	X	X	X	
	IS082IU	Retail Management	**3**		X		X	X		X
	IS066IU	Data Mining In Supply Chain	**3**	X		X		X		X
50	_____IU	Nhóm tự chọn số 05 - Free Elective Course (choose 1 course below)	**3**							
		Total credits	**15**							
Semester 9										
51	IS048IU	Thesis	**10**	X	X	X	X	X	X	X
		Total credits	**10**							

[4]Cột "Tên môn học": liệt kê tất cả các môn học của CTĐT được phân bố theo học kỳ. Mỗi môn học, cần xác định rõ mức độ đóng góp vào các CĐR tương ứng, và thống nhất với thông tin được xác định trong đề cương môn học. Đối với nhóm môn học tự chọn, trình độ năng lực với các CĐR phải tương ứng nhau.

[5]Cột "Chuẩn đầu ra của CTĐT": liệt kê tất cả CĐR của CTĐT. Chỉ lần liệt kê dưới dạng PLOi, không ghi nội dung cụ thể CĐR.

12. Mô tả vắn tắt nội dung và khối lượng các môn học

(số thứ tự của môn học tương ứng với số thứ tự của môn học trong nội dung chương trình đào tạo)

1) Phương pháp triết học Mác – Lênin (Philosophy of Marxism and Leninism)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Môn học song hành:** PE016IU - Political economics of Marxism and Leninism
- **Mô tả nội dung môn học:** Môn học trang bị cho sinh viên những nội dung cơ bản về thế giới quan, phương pháp luận triết học Mác – Lênin. Giúp cho sinh viên vận dụng những tri thức về thế giới quan, phương pháp luận triết học Mác – Lênin một cách sáng tạo trong hoạt động nhận thức và thực tiễn, nhằm giải quyết những vấn đề mà đời sống xã hội của đất nước, của thời đại đang đặt ra.

2) Kinh tế chính trị Mác–Lênin (Political economics of Marxism and Leninism)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Môn học song hành:** PE015IU - Philosophy of Marxism and Leninism
- **Mô tả nội dung môn học:**
    - Một là, trang bị cho sinh viên những kiến thức cơ bản, cốt lõi của Kinh tế chính trị Mác – Lênin trong bối cảnh phát triển kinh tế của đất nước và thế giới ngày nay. Đảm bảo tính cơ bản, hệ thống, khoa học, cập nhật tri thức mới, gắn với thực tiễn, tính sáng tạo, kỹ năng, tư duy, phẩm chất người học, tính liên thông khắc phục trùng lặp, tăng cường tích hợp và giảm tải, lược bớt

những nội dung không còn phù hợp hoặc những nội dung mang tính kinh viện đối với sinh viên các trường Cao đẳng, Đại học không chuyên lý luận.

- Hai là, trên cơ sở hình thành tư duy, kỹ năng phân tích, đánh giá và nhận diện bản chất của các quan hệ lợi ích kinh tế trong phát triển kinh tế - xã hội của đất nước góp phần giúp sinh viên xây dựng trách nhiệm xã hội phù hợp trong vị trí việc làm và cuộc sống khi ra trường.
- Ba là, góp phần xây dựng lập trường, ý thức hệ tư tưởng Mác – Lênin đối với các sinh viên.

3) Chủ nghĩa Khoa Học Xã Hội (Scientific socialism)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết:** Không
- **Môn học trước:**
  - PE015IU - Philosophy of Marxism and Leninism
  - PE016IU - Political economics of Marxism and Leninism
- **Mô tả nội dung môn học:** Môn học trang bị cho sinh viên những nội dung cơ bản của chủ nghĩa xã hội khoa học (một trong ba bộ phận cấu thành chủ nghĩa Mác – Lênin). Giúp cho sinh viên vận dụng những tri thức cơ bản của chủ nghĩa xã hội khoa học một cách sáng tạo trong hoạt động nhận thức và thực tiễn, nhằm giải quyết những vấn đề mà đời sống xã hội của đất nước, của thời đại đang đặt ra.

4) Lịch sử Đảng Cộng Sản Việt Nam (History of the Communist Party of Vietnam)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết:** Không
- **Môn học trước:** PE017IU - Chủ nghĩa xã hội khoa học.
- **Mô tả nội dung môn học:**
  - Về nội dung: cung cấp những tri thức có tính hệ thống, cơ bản về sự ra đời của Đảng cộng sản Việt Nam (1920-1930), sự lãnh đạo của Đảng đối với cách mạng Việt nam trong thời kỳ đấu tranh giành chính quyền (1930-1945), trong hai cuộc kháng chiến chống thực dân Pháp và đế quốc Mỹ xâm lược (1945-1975), trong sự nghiệp xây dựng, bảo vệ Tổ quốc thời kỳ cả nước quá độ lên chủ nghĩa xã hội, tiến hành công cuộc đổi mới (1975-2018)
  - Về tư tưởng: Thông qua các sự kiện lịch sử và các kinh nghiệm về sự lãnh đạo của Đảng để xây dựng ý thức tôn trọng sự thật khách quan, nâng cao lòng tự hào, niềm tin đối với sự nghiệp lãnh đạo của Đảng.
  - Về kỹ năng: Trang bị phương pháp tư duy khoa học về lịch sử, kỹ năng lựa chọn tài liệu nghiên cứu, học tập môn học và khả năng vận dụng nhận thức lịch sử các công tác thực tiễn, phê phán quan niệm sai trái về lịch sử của Đảng.

5) Tư tưởng Hồ Chí Minh (HCM's thoughts)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết:** Không
- **Môn học trước:** PE017IU - Chủ nghĩa xã hội khoa học.
- **Mô tả nội dung môn học:**
    - Về kiến thức: Trang bị cho sinh viên những kiến thức cơ bản về khái niệm, nguồn gốc, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh; những nội dung cơ bản của tư tưởng Hồ Chí Minh; sự vận dụng của Đảng Cộng sản Việt Nam trong cách mạng dân tộc dân chủ và cách mạng xã hội chủ nghĩa, trong công cuộc đổi mới hiện nay.
    - Về kỹ năng: Giúp cho sinh viên khả năng tư duy, phân tích, đánh giá, vận dụng sáng tạo tư tưởng Hồ Chí Minh vào giải quyết các vấn đề trong thực tiễn đời sống, học tập và công tác.
    - Về thái độ: Giúp sinh viên nâng cao về bản lĩnh chính trị, yêu nước, trung thành với mục tiêu, lý tưởng độc lập dân tộc gắn liền với chủ nghĩa xã hội, nhận thức được vai trò, giá trị của tư tưởng Hồ Chí Minh đối với Đảng và dân tộc Việt Nam; thấy được trách nhiệm của bản thân trong việc học tập, rèn luyện để góp phần vào xây dựng và; bảo vệ Tổ quốc.

6) Tiếng Anh chuyên ngành 1 - Kỹ năng Viết (Writing AE1)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học nhằm nâng cao kỹ năng viết trình độ tiền nâng cao (pre-advanced). Chương trình tập trung vào việc xây dựng bài luận dựa trên các kỹ năng viết như: làm dàn bài, viết câu luận đề, kết nối và sắp xếp trình tự các đoạn, dung từ và cụm từ nối để tạo sự mạch lạc cho bài văn. Các thể loại bao gồm: miêu tả người, đồ vật, qui trình, trình bày ý kiến, so sánh và đối chiếu, nguyên nhân – kết quả, vấn đề - giải pháp, nghị luận.
  This course provides students with comprehensive instructions and practice in essay writing, including transforming ideas into different functions of writing such as process, cause-effect, comparison-contrast, and argumentative essays.

- **Mục tiêu môn học:**
    - Giúp sinh viên làm quen với phương pháp viết tiếng Anh học thuật
    - Thực hành viết bài luận
    - Nâng cao kỹ năng viết tiếng Anh học thuật

    - *Throughout the whole course, students are required to read university-level texts to develop the ability to read critically and to respond accurately, coherently and academically in writing. Through providing them with crucial writing skills such as brainstorming, paraphrasing, idea developing,*

revising, and editing, this course prepares the students for research paper writing in the next level of AE2 writing.

7) Tiếng Anh chuyên ngành 1 - Kỹ năng Nghe (Listening AE1)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Những kỹ năng nghe tiếng Anh học thuật, ghi chú, và thảo luận sẽ giúp sinh viên làm quen với những khó khăn trong việc học tiếng Anh ở đại học. Sinh viên sẽ học các kỹ năng cần thiết cho sinh viên đại học quốc tế, bao gồm: nghe bài giảng chủ động, ghi chú hiệu quả, tham gia thảo luận tự tin. Đồng thời, sinh viên cũng sẽ trau dồi vốn từ vựng học thuật.
  The course is designed to prepare students for effective listening and note-taking skills, so that they can pursue the courses in their majors without considerable difficulty. The course is therefore lecture-based in that the teaching and learning procedure is built up on lectures on a variety of topics such as business, science, and humanities.

- **Mục tiêu môn học:**
  - Rèn luyện cho sinh viên thói quen nghe một cách chủ động
  - Giúp sinh viên nâng cao vốn từ vựng tiếng Anh.
  - Giúp sinh viên nâng cao kỹ năng nghe – ghi chép.
  - Giúp sinh viên nhận dạng "ngôn ngữ của bài giảng" mà giáo viên thường sử dụng như: dấu hiệu, đặc điểm, và từ vựng của ngôn bản.
  - Trau dồi kỹ năng tư duy phân tích.

8) Tiếng Anh chuyên ngành 2 - Kỹ năng Viết (Writing AE2)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết:**
  - EN007IU - Listening AE1
  - EN008IU - Writing AE1
- **Mô tả nội dung môn học:** Môn học nhằm cung cấp một cách tổng quát cấu trúc của một bài viết báo cáo nghiên cứu, từng bước giúp sinh viên hoàn tất một bài viết cụ thể trong lĩnh vực của mình. Nội dung của môn học bao gồm: các thành phần của bài báo cáo, kỹ năng chọn và giới hạn đề tài, viết câu luận đề, làm dàn bài, tìm và dẫn chứng tài liệu, ghi chú, viết mở bài, nội dung chính và kết luận, viết và sửa chữa bản nháp. Sinh viên sẽ thực hành trên các đề tài liên quan đến ngành học.
- Mục tiêu môn học:
  - Chọn và giới hạn đề tài nghiên cứu
  - Hình thành, đánh giá, và sửa chữa câu luận đề
  - Sắp xếp ý và viết dàn bài
  - Tìm và đánh giá nguồn tài liệu

- Dẫn chứng tài liệu chính xác
- Ghi chú bằng nhiều cách

9) Tiếng Anh chuyên ngành 2 - Kỹ năng Nói (Speaking AE2)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết:**
  - EN007IU - Listening AE1
  - EN008IU - Writing AE1
- **Mô tả nội dung môn học:** Môn học cung cấp cho sinh viên các chiến lược thiết thực sử dụng trong việc thuyết trình. Ngoài ra sinh viên được giúp đỡ hình thành kỹ năng lắng nghe, nhận xét và nêu ý kiến phản hồi đối với các bài thuyết trình khác trong lớp
- **Mục tiêu môn học:** Trang bị cho sinh viên kiến thức và kỹ năng thuyết trình bằng tiếng Anh trước công chúng: các bước chuẩn bị, chọn văn phong phù hợp, sử dụng tiếng Anh chuẩn xác nhằm truyền đạt đến đối tượng nghe thích hợp.

10) Giải tích 1 (Calculus 1)

- **Số tín chỉ:** 4 tín chỉ (Lý thuyết: 4, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Hàm số, Giới hạn, Tính liên tục, Đạo hàm, Đạo hàm cho các hàm cơ bản, Quy tắc tính đạo hàm, Ứng dụng của đạo hàm, Quy tắc L'hospitail, Tối ưu, Phương pháp Newton, Tích phân, Tích phân xác định, Các định lý cơ bản của giải tích, kỹ thuật tính tích phân.
  Functions; Limits; Continuity; Derivatives, Differentiation, Derivatives of Basic Elementary Functions, Differentiation Rules; Applications of Differentiation: l'Hôpital's Rule, Optimization, Newton's Method; Anti-derivatives; Indefinite Integrals, Definite Integrals, Fundamental Theorem of Calculus; Techniques of Integration; Improper Integrals; Applications of Integration

11) Giải tích 2 (Calculus 2)

- **Số tín chỉ:** 4 tín chỉ (Lý thuyết: 4, Thực hành: 0)
- **Điều kiện tiên quyết:** MA001IU - Giải tích 1 (Calculus 1)
- **Mô tả nội dung môn học:** Dãy và Chuỗi; Các kiểm chứng hội tụ; Chuỗi hàm mũ; Chuỗi Taylor và Maclaurin; Tọa độ Descartes; Đường, mặt phẳng và các bề mặt; Các hàm vectơ và tích phân, Chiều dài cung và đường cong, tham số bề mặt; Hàm đa biến; Giới hạn, liên tục, vi phân từng phần, mặt phẳng tiếp tuyến; Các vector gradient; cực trị; Đa thức Lagrange; Tích phân nhiều lớp: Tích phân hai lớp, Tích phân ba lớp, kỹ thuật hội tụ; Các miền vector, Tích phân đường, Tích phân mặt.
  Sequence and Series; Convergence Tests; Power Series; Taylor and Maclaurin Series; Cartesian Coordinates; Lines, Planes and Surfaces; Derivatives and Integrals of Vector Functions, Arc Length and Curvature, Parametric Surfaces;

Functions of Several Variables; Limits, Continuity, Partial Derivatives, Tangent Planes; Gradient Vectors; Extrema; Lagrange Multipliers; Multiple Integrals: Double Integrals, Triple Integrals, Techniques of Integration; Vector Fields, Line Integrals, Surface Integrals.

12) Vật lý 1 (Physics 1)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Khảo sát động học, động lực học, năng lượng học của chuyển động của chất điểm và của vật rắn. Khảo sát động lực học lưu chất, tính chất của khí lí tưởng, và các nguyên lí nhiệt động lực học.
  This course examines concepts and principles of kinetics, dynamics, energetics of motion of a material particle, solid, fluid dynamics, properties of ideal gas, and thermodynamics

13) Vật lý 2 (Physics 2)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Khảo sát động lực học lưu chất, tính chất của khí lí tưởng, và các nguyên lí nhiệt động lực học.
  This course provides students basic knowledge about fluid mechanics; macroscopic description of gases; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gases and the kinetic theory of gases.

14) Hóa cơ bản (Chemistry for Engineers)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học thiết kế dành cho sinh viên ngoài ngành kỹ thuật hóa học. Môn học cung cấp các nguyên lý cơ bản về hoá học cần thiết để tiếp thu kiến thức ở các môn học cơ sở. Nội dung của môn học bao gồm bản chất hóa học của vật chất, trạng thái của vật chất, liên kết hóa học, độ bền hóa học, cấu trúc hóa học, phản ứng hóa học, cân bằng hóa học, tốc độ phản ứng, nhiệt động học, năng lượng hóa học, điện hóa học, lực tương tác giữa các phân tử, phức chất và hóa học hạt nhân.
  This course is designed for non-chemistry majors. The course provides a strong background in the fundamentals of chemistry, preparing students for further study in their major field. Topics include important principles, theories, concepts of chemistry, and chemical calculations necessary for a comprehension of the structure of matter, the chemical actions of the common elements and compounds. The impact

of chemistry on everyday life and on the environment is also introduced wherever possible.

15) Pháp luật đại cương (General Law)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:**
    - Cung cấp những kiến thức cần thiết về hệ thống pháp luật Việt Nam thông qua công nghệ tích hợp và các trường hợp thực tế cho sự bền vững về xã hội và văn hóa, qua đó nâng cao nhận thức về trách nhiệm đối với người khác và cách bảo vệ chấm dứt các loại vi phạm pháp luật, đặc biệt là tham nhũng trong các lĩnh vực xã hội.
    - Rèn luyện các kỹ năng cần thiết để đóng vai trò là đại sứ đảm bảo xã hội công bằng và quyền bình đẳng toàn cầu. Đồng thời, sử dụng các nguồn pháp lý trực tuyến tích hợp và các công cụ truyền thông để trợ giúp cộng đồng để xác định các vấn đề và phát triển các biện pháp đối phó.
    - *The course provides essential knowledge about the Vietnamese legal system through integrated technology and real-life cases to promote social and cultural sustainability. This helps raise awareness of individual responsibility toward others and how to prevent and eliminate legal violations, especially corruption in various social sectors.*
    - *The course develops necessary skills to act as ambassadors for social justice and global equality. At the same time, utilize integrated online legal resources and communication tools to assist communities in identifying issues and developing responsive solutions.*

16) Đại số tuyến tính ứng dụng (Applied Linear Algebra)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học cung cấp cho sinh viên kiến thức cơ bản về đại số tuyến tính với các ứng dụng, đặc biệt là kỹ năng giải các hệ phương trình tuyến tính bằng phương pháp khử Gauss.

  The course provides the student with basic knowledge in linear algebra with applications, in particular the skill of solving linear systems of equations using Gauss elimination method.

17) Đạo đức kỹ thuật và tư duy phân tích (Engineering Ethics and Critical Thinking)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học này trang bị cho sinh viên kiến thức nền tảng về đạo đức nghề nghiệp trong lĩnh vực kỹ thuật và công nghệ, đồng thời phát triển

tư duy phản biện (phân tích, đánh giá, lập luận) nhằm nâng cao khả năng ra quyết định có trách nhiệm trong môi trường làm việc chuyên nghiệp.
This course equips students with foundational knowledge of professional ethics in the fields of engineering and technology, while also developing critical thinking skills (analysis, evaluation, reasoning) to enhance responsible decision-making in a professional working environment.

18) Tin học cho kỹ sư (Introduction to Computing)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học này cung cấp cho sinh viên kiến thức cơ bản và kỹ năng sử dụng máy tính trong lĩnh vực kỹ thuật, tập trung vào các công cụ và phương pháp tính toán hỗ trợ giải quyết các bài toán kỹ thuật.
  This course provides students with fundamental knowledge and skills in using computers in the field of engineering, focusing on computational tools and methods that support solving engineering problems.

19) Xác suất thống kê cho kỹ thuật (Engineering Probability and Statistics)

- **Số tín chỉ:** 4 tín chỉ (Lý thuyết: 3, Thực hành: 1)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học khảo sát các khái niệm khác nhau trong xác suất và thống kê, thảo luận về các kỹ thuật thống kê và ứng dụng trong các tình huống thực tế. Các chủ đề chính của môn học bao gồm: thống kê mô tả, biến ngẫu nhiên rời rạc và liên tục, lấy mẫu và phân bố mẫu, khoảng tin cậy, thử nghiệm giả thuyết, phân tích phương sai, hồi quy tuyến tính.
  The aim of this course is to examine various concepts in probability and statistics. This course also discusses various statistical techniques and the use of them in practical situations. Key topics of this course include: descriptive statistics, discrete and continuous random variables, sampling and sampling distributions, confidence intervals, hypothesis testing, analysis of variance, simple linear and multiple regressions.

20) Kinh tế kỹ thuật (Engineering Economy)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Tất cả các quyết định về quản lý và kỹ thuật đều mang đến những hệ quả về kinh tế, như là lợi nhuận hoặc rủi ro. Môn học này cung cấp những kiến thức và kỹ thuật cần thiết đánh giá các phương án ra quyết định. Các chủ đề được trình bày trong môn học này gồm có: khấu hao, ước lượng và quản lý chi phí, thuế, lạm phát, rủi ro và không chắc chắn trong việc ra quyết định, phân tích phương án thay thế thiết bị, phân tích dòng tiền tệ.

Economic decisions involving engineering alternatives; annual cost, present & future worth, rate of return, and benefit-to-cost; before and after tax replacement

21) Vẽ kỹ thuật (Engineering Drawing)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học này cung cấp cho sinh viên các kỹ năng để trình bày và giải thích các mô hình không gian trên các mô hình phẳng, trình bày các bản vẽ kỹ thuật theo tiêu chuẩn quốc tế (ISO). Các phương pháp trình bày mô hình: phép chiếu trực giao, phép chiếu đẳng cự, phép chiếu xiên Áp dụng các hình chiếu để trình bày các đối tượng trong bản vẽ.
  This subject will provide student skills to present and interpret spatial models on planar models, and present engineering drawings according to international standards (ISO). Methods of presenting models: orthographic projections, isometric projection, sections of solids, ... Apply the projections to present objects in the drawings.

22) CAD/CAM/CNC

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 2, Thực hành: 1)
- **Môn học trước:** IS102IU - Engineering Drawing
- **Mô tả nội dung môn học:** Môn học này giới thiệu cho sinh viên về các phương pháp sản xuất hiện đại với trọng tâm đặt tại ba lĩnh vực: thiết kế với hỗ trợ của máy tính, sản xuất với hỗ trợ của máy tính, và lập kế hoạch quy trình với hỗ trợ của máy tính.Môn học này sẽ cung cấp các kiến thức, khái niệm, công nghệ quan trọng và những sự phát triển tiên tiến trong CAD/CAM. Các chủ đề được trình bày trong môn học này gồm có: các đặc điểm kỹ thuật trong thiết kế chi tiết, lập trình NC, lập kế hoạch quy trình đơn giản và với sự hỗ trợ của máy tính, các hệ thống CAD và CAM, hệ thống trao đổi dữ liệu CAD/CAM.f
- **Mục tiêu môn học:**
  - Có được những hiểu biết cơ bản về các khái niệm trong CAD/CAM.
  - Sử dụng các phần mềm CAD/CAM để thiết kế kỹ thuật.
  - Hiểu được các ứng dụng của CAD/CAM vào những giai đoạn khác nhau trong quá trình thiết kế và sản xuất một sản phẩm.

23) Quản lý sản xuất (Production management)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Sau khi học xong môn này, sinh viên có thể hiểu rõ vai trò, mục tiêu và quy trình quản lý sản xuất và điều hành trong doanh nghiệp. Phân tích một vấn đề trong kinh doanh, cung cấp các giải pháp quản lý sản xuất, điều hành, quản lý chuỗi cung ứng để tối ưu hóa hệ thống nội bộ. Ứng dụng các công cụ

phân tích ví dụ như mô hình kiểm soát hàng tồn kho, để đáp ứng nhu cầu cạnh tranh trong và ngoài nước và đưa ra quyết định trong kinh doanh.

On completion of this unit students will be able to: Articulate the role, objectives and processes of operations management and how operations management is applied in businesses, Analyse a business problem to provide operations management solutions to optimise internal systems including production scheduling and supply chain management, Utilise a range analytical tools such as inventory control models to satisfy competing internal and external demands and make business decisions.

24) Giới thiệu về ngành kỹ thuật hệ thống công nghiệp (Introduction to Industrial Engineering)

- **Số tín chỉ:** 1 tín chỉ (Lý thuyết: 0, Thực hành: 1)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mục tiêu môn học:** Môn học giới thiệu về ngành Kỹ thuật Hệ thống Công Nghiệp, các vấn đề và ứng dụng.
- **Mô tả nội dung môn học:** Môn học giới thiệu về ngành Kỹ thuật Hệ thống Công nghiệp trong hệ thống các ngành kỹ thuật ở Việt Nam và khu vực, đề cập đến các ứng dụng trong công nghiệp, bao gồm sản xuất và dịch vụ. Môn học này cũng cung cấp những phương tiện thực hành để làm quen với công nghệ. Sinh viên sẽ dùng ngôn ngữ C/ C++ để viết các chương trình.

  This course introduces the field of Industrial Systems Engineering within the broader context of engineering disciplines in Vietnam and the region. It covers its applications in industry, including both manufacturing and services. The course also provides practical tools to familiarize students with technology. Students will use the C/C++ programming language to write programs.

25) Vận trù học 1- Các mô hình tất định (Deterministic model in OR)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** Không
- **Môn học trước:** MA027IU - Applied Linear Algebra
- **Mô tả nội dung môn học:** Môn học trang bị các kiến thức cơ bản về quy hoạch toán học như quy hoạch tuyến tính, quy hoạch phi tuyến, quy hoạch động, quy hoạch nguyên. Các quy hoạch toán học này là những công cụ quan trọng cho việc phân tích các mô hình tất định để tối ưu hóa các bài toán thực tế trong quản lý sản xuất và dịch vụ cũng nhý trong các lĩnh vực khác.

  Elements of problem solving and algorithmic design. Use of numerical analysis and linear algebra to solve industrial engineering problems. Topics to be covered include: problem formulations, simplex method in tableau form, duality theory, an introduction to the geometry of the simplex method, sensitivity analysis,

transportation and network flow problems, optimality conditions and basic numerical methods for nonlinear programs.

26) Đo lường lao động & Thiết kế công việc (Work design & Ergonomics)

- **Số tín chỉ:** 4 tín chỉ (Lý thuyết: 3, Thực hành: 1)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Phân tích các thao tác, thiết kế công việc thủ công, thiết kế vị trí làm việc, môi trường làm việc, định mức thời gian cho công việc, cách đánh giá hiệu suất công việc.
- **Mục tiêu môn học:** Môn học này giới thiệu cho sinh viên những kiến thức cơ bản về đo lường công việc, phân tích phương pháp và nghiên cứu lao động. Môn học này chú trọng vào các phương pháp phân tích định lượng.

27) Thiết kế và phát triển sản phẩm (Product Design & Development)

- **Số tín chỉ:** 4 tín chỉ (Lý thuyết: 3, Thực hành: 1)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học này sẽ trình bày những chủ đề về kỹ thuật và kinh tế quan trọng đối với việc phát triển các sản phẩm kỹ thuật. Thiết kế tối ưu, các suy nghĩ sáng tạo, các nguyên lý và phương pháp luận về phát triển sản phẩm sẽ được nhấn mạnh. Sinh viên sẽ học những quy trình phát triển sản phẩm mới, các công cụ, kỹ thuật, và các cấu trúc tổ chức nền tảng của quy trình phát triển sản phẩm
- **Mục tiêu môn học:** Môn học này cung cấp cho sinh viên kiến thức về sự phát triển của các sản phẩm sáng tạo và thiết thực hướng tới khách hàng. Các khái niệm và kỹ thuật thiết kế sẽ được thảo luận, bên cạnh việc tối ưu thiết kế, cùng với các vấn đề kinh tế và xã hội có liên quan. Sau khi hoàn thành môn học này, sinh viên sẽ hiểu được các quy trình phát triển sản phẩm mới, các công cụ, kỹ thuật và cấu trúc tổ chức hữu ích hỗ trợ cho quá trình phát triển sản phẩm mới.

28) Mô hình hóa và mô phỏng (Simulation models in industrial Engineering)

- **Số tín chỉ:** 4 tín chỉ (Lý thuyết: 3, Thực hành: 1)
- **Điều kiện tiên quyết:** IS112IU - Engineering Probability & Statistics
- **Mô tả nội dung môn học:** Môn học trang bị các kiến thức cơ bản để mô phỏng hệ thống thực với các nội dung xây dựng mô hình, chọn phân bố, mô phỏng các biến ngẫu nhiên…, qua đó phân tích tìm hiểu hoạt động của hệ thống, trợ giúp ra quyết định cho việc so sánh, tối ưu hóa hệ thống.
  Modeling and analysis of industrial and service systems, modeling perspectives, discrete event and continuous simulation, model building using ARENA/SIMAN, statistical aspects of simulation.

29) Kỹ thuật điều độ trong Sản xuất và Dịch vụ (Scheduling & Sequencing)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)

- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Mục đích môn học nhằm cung cấp các kiến thức từ các khái niệm cơ bản đến các kinh nghiệm thực tiễn trong công tác điều độ. Môn học này sẽ giới thiệu các giải thuật điều độ cho máy đơn, máy song song, mô hình flow shop, job shop. Đồng thời môn học cũng cung cấp các phương pháp để giải quyết những vấn đề điều độ như giải thuật kinh nghiệm, giải thuật xây dựng, phương pháp phân nhánh – giới hạn (Branch-and-Bound).
  This course gives an introduction to scheduling problems: techniques, principles, algorithms and computerized scheduling systems. Topics include scheduling algorithms for single machine, parallel machine, flow shop, job shop and also solution methodologies such as heuristic procedures, constructive algorithms, branch and bound approaches, and genetic algorithms.

30) Quản lý vật tư tồn kho (Inventory management)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** Không
- **Môn học trước:** IS112IU - Engineering Probability & Statistics
- **Mô tả nội dung môn học:** Mọi tổ chức đều lưu trữ nguyên vật liệu để ứng phó với những biến đổi và sự không chắc chắn trong cung và cầu. Tồn kho được bổ sung bởi việc giao hàng từ nhà cung cấp và giảm đi khi đáp ứng nhu cầu của khách hàng. Quản lý hàng tồn kho chịu trách nhiệm cho tất cả các khía cạnh của quản lý kho. Mức tồn kho cao làm cho chi phí tăng cao và các tổ chức liên tục tìm cách giảm chi phí hàng tồn kho của họ mà không làm ảnh hưởng đến dịch vụ của mình. Môn học này cung cấp cho sinh viên sự hiểu biết về các nguyên lý, quy trình và phương pháp quản lý hiệu quả hàng tồn kho liên quan đến các hoạt động khác trong chuỗi cung ứng. Môn học xem xét các phương pháp liên quan đến nhu cầu độc lập và nhu cầu phụ thuộc. Môn học cũng nhấn mạnh đến các thông tin cần thiết để hỗ trợ các phương pháp, bao gồm cả thông tin từ các Hệ thống thông tin quản lý với ứng dụng ERP hàng tồn kho, dự báo nhu cầu và hoạt động theo kế hoạch.
  Every organisation holds stocks of materials to allow for variations and uncertainty in supply and demand. Stocks are replenished by deliveries from suppliers and reduced to meet demands from customers. Inventory management is responsible for all aspects of stock control. High stock buffer comes at a high price and organisations are continually looking for ways of reducing their inventory costs without affecting service. This course provides students with an understanding of the principles, processes and methods for the effective management of inventory in relation to other activities in the supply chain. The course examines both the independent demand and dependent demand methods. Attention is given to the information needed to support these methods, including information from the inventory Management Information Systems with ERP Applications, forecasts of demand and planned operations.

31) Hệ thống thông tin quản lý với ứng dụng ERP (Management Information Systems with ERP Applications)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/ Môn học trước**: Không.
- **Mô tả nội dung môn học:** Môn học nhằm trang bị cho sinh viên các kiến thức nền tảng về Hệ thống thông tin quản lý với ứng dụng ERP. Vai trò của hệ thống thông tin trong công tác quản lý được phân tích. Các kỹ năng, công cụ đánh giá, phân tích và Thiết kế thực nghiệm thông tin được trình bày.
- **Mục tiêu của môn học:** Sau khi hoàn thành môn học này, sinh viên sẽ có khả năng:
    - Áp dụng các khái niệm về hệ thống và thông tin vào doanh nghiệp
    - Xác định nhu cầu của doanh nghiệp đối với thương mại điện tử. Áp dụng các công cụ phát triển vào hệ thống thông tin doanh nghiệp
    - Thảo luận những vấn đề về đạo đức, bảo mật, và quản lý toàn cầu khi mà chúng có liên quan đến hệ thống thông tin máy tính.

32) Hệ thống sản xuất tinh gọn (Lean Production)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/ Môn học trước**: Không.
- **Mô tả nội dung môn học:** Môn học này giới thiệu cho sinh viên những nguyên lý và thực tiễn của sản xuất tinh gọn. Môn học này sẽ cung cấp cho sinh viên nền tảng cơ bản về sản xuất tinh gọn, phương pháp đánh giá các hệ thống sản xuất, các công cụ và kỹ thuật trong sản xuất tinh gọn, các vấn đề nhân sự, huấn luyện, văn hóa doanh nghiệp liên quan đến sản xuất tinh gọn, lập kế hoạch để tiến hành sản xuất tinh gọn và sự cần thiết của cải tiến bền vững. Các ví dụ về ứng dụng trong sản xuất và kinh doanh cũng sẽ được trình bày trong môn học này.
- **Mục tiêu của môn học:** Sau khi hoàn thành môn học này sinh viên sẽ có khả năng:
    - Phân tích những dạng lãng phí phổ biến trong công nghiệp.
    - Mô tả ảnh hưởng của lãng phí đến khả năng cạnh tranh và lợi nhuận tổ chức.
    - Phân biệt các dạng chiến lược khác nhau trong sản xuất tinh gọn.
    - Liên hệ giữa các nguyên lý chất lượng với chiến lược sản xuất tinh gọn.
    - Xác định các phương pháp để đo lường tinh gọn.
    - Phát triển chiến lược để áp dụng sản xuất tinh gọn.

33) Quản lý Chất lượng (Quality Management)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** IS112IU - Engineering Probability & Statistics
- Mô tả nội dung môn học:
    - Môn học này cung cấp cho sinh viên những hiểu biết về các nguyên lý, khái niệm và các kỹ thuật cơ bản liên quan đến Quản lý chất lượng tổng thể. Môn học ban đầu sẽ tập trung vào các khái niệm về chất lượng và sự đóng góp của

các chuyên gia về quản lý chất lượng. Tiếp theo, môn học sẽ giúp tìm hiểu quá trình thực hiện TQM, các giải thưởng và chứng nhận về chất lượng thường được áp dụng trong doanh nghiệp để đánh giá kết quả thực hiện của doanh nghiệp đó. Các vấn đề trên cũng liên quan đến việc quản lý các phản ánh của khách hàng và thị trường. Sau đó môn học sẽ giúp tìm hiểu các kỹ thuật khác nhau có thể được sử dụng để thiết kế và nâng cao chất lượng sản phẩm và dịch vụ.

- This course provides students with an understanding of the fundamental principles, concepts and techniques relating to Total Quality Management. This course will first focus on quality concepts and the contributions of various quality gurus to quality management. Next, we will explore the implementation process of TQM and the major quality awards and certifications sought after by organisations in their quest for performance excellence. This will be followed by the management of the Voice of the Customer and the Voice of the Market. We will then explore the different techniques that can be used to design and improve quality in products and services.

34) Quản lý dự án (Project management)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/ Môn học trước**: Không.
- **Mô tả nội dung môn học:** Môn học này cung cấp các khái niệm cơ bản về quản lý dự án được mô tả thông qua quyển hướng dẫn về quản lý dự án (PMBOK Guide). Quyển hướng dẫn này nhấn mạnh về năm nhóm quy trình quản lý dự án, gồm có: khởi tạo, lập kế hoạch, thực thi, kiểm soát, và kết thúc. Đồng thời, quyển sách cũng nhấn mạnh về 9 khối kiến thức của dự án bao gồm: tích hợp, phạm vi, thời gian, chi phí, chất lượng, nhân lực, thông tin, rủi ro, và mua sách. Bên cạnh đó, môn học cũng cung cấp kiến thức về các phần mềm máy tính hỗ trợ cho quản lý dự án như Microsoft Project. Hoạch định và thực hiện dự án là những hoạt động quan trọng trong phát triển công nghiệp. Môn học trang bị các kiến thức cơ bản để xem xét toàn bộ các giai đoạn của dự án với các khía cạnh quản lý, kinh tế, kỹ thuật, và tài chính qua đó có thể quản lý dự án một cách hiệu quả. Môn học bao gồm các nội dung: xác định, đánh giá và chọn lựa dự án, cấu trúc dự án, điều độ dự án, quản lý nguồn lực, công nghệ, ngân sách, chi phí, kiểm soát dự án, kết thúc dự án. Môn học còn trang bị kiến thức về các dự án nghiên cứu & phát triển, về hỗ trợ máy tính trong quản lý dự án.

  This course is developed to provide the principal concept on project management which was characterized by the project management body of knowledge guide (PMBOK Guide). This guide emphasizes the five project process groups of initiating, planning, executing, controlling and closing, and the nine knowledge areas of project integration, scope, time, cost, quality, human resources,

communication, risk, and procurement management. In addition, this course also provides computer aid for project management by introducing the application of Microsoft Project and project scheduling.

35) Kỹ thuật dự báo (Time Series & Forecasting technique)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** Không
- **Môn học trước:** IS112IU - Engineering Probability & Statistics
- **Mô tả nội dung môn học:** Định nghĩa đơn giản nhất của dự báo là một quá trình với mục tiêu dự đoán các sự kiện hoặc điều kiện ở tương lai một cách chính xác nhất có thể nhằm ra quyết định tốt hơn. Mục tiêu của môn học trang bị cho sinh viên các kiến thức: Sự thiết lập và các đặc điểm của các mô hình dự báo. Thu thập, diễn dịch, tổ chức , phân tích dữ liệu để xây dựng các mô hình dự báo. Các khái niệm nền tảng về thống kê và xác suất dung trong dự báo. Các cấu trúc thứ bậc của các mô hình dự báo. Sử dụng các phần mềm trong hoạt động dự báo.
  The simplest definition of economic forecasting is that it is a process that has as its objective the prediction of future events or conditions to reduce that uncertainty so that our decisions will be better ones. Specific objectives are to instruct you in: the formulation and specification of forecasting models; data collection, interpretation, organization, and analysis for building forecasting models; fundamental statistical and probability concepts used in forecasting; the existence of a hierarchy of forecasting models; the use of econometric software in a lab setting.

36) Thiết kế thực nghiệm (Experimental Design)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** IS112IU - Engineering Probability & Statistics
- **Mô tả nội dung môn học:** Môn học này cung cấp cho sinh viên kiến thức về lập kế hoạch để tiến hành nhiều loại thực nghiệm khác nhau, áp dụng các kỹ thuật thống kê vào việc phân tích và diễn giải kết quả của thực nghiệm. Các chủ đề được trình bày trong môn học này gồm có: thiết kế thực nghiệm thừa số, thiết kế khối ngẫu nhiên hóa, thiết kế khối không hoàn chỉnh, thiết kế hình vuông Latin, thiết kế lai, và thiết kế tối ưu.
- **Mục tiêu của môn học:**
  - Lập kế hoạch, thiết kế, và tiến hành các thực nghiệm một cách hiệu quả. Một thực nghiệm được thiết kế tốt sẽ cho phép thu được kết quả đáng tin cậy, hợp lệ nhanh hơn, dễ dàng hơn, và tiêu hao ít nguồn lực hơn là một thực nghiệm được thiết kế kém.
  - Phân tích dữ liệu thu từ thực nghiệm để đạt được các kết luận có ý nghĩa.
  - Sử dụng hiệu quả các từ chuyên ngành dùng trong thiết kế thực nghiệm.

37) Kỹ thuật ra quyết định đa mục tiêu (Multi – Criteria decision making)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** IS112IU - Engineering Probability & Statistics
- **Môn học trước:**
    - IS103IU - Deterministic Models in OR
- **Mô tả nội dung môn học:** Kỹ thuật ra quyết định (KTRQĐ) là một phần quan trọng trong lĩnh vực vận trù học (Operations Research) hay Khoa học quản lý (Management Science). KTRQĐ giúp các nhà ra quyết định chọn lựa các phương án dựa trên các tiêu chuẩn định lượng. Môn học trang bị các kiến thức cơ bản về lập mô hình và ra quyết định từ các mô hình này, về việc sử dụng các kỹ thuật cụ thể cho các áp dụng thực tế trong quản lý sản xuất & dịch vụ cũng nhý các lĩnh vực khác. Môn học khảo sát việc ra quyết định trong môi trường từ xác định (deterministic) đến ngẫu nhiên (stochastic), từ vấn đề đơn tiêu chuẩn (mono-criterion) đến vấn đề đa tiêu chuẩn (multicriterion), từ vấn đề đa mục tiêu (MODM) đến vấn đề đa thuộc tính (MADM).

  Decision making is one of the important parts in operation research or management science. Decision making techniques help management to choose the best alternative based on quantitative criteria. This course provides students with basic knowledge about decision model formulation, so that they can make decisions based on the results of the models. This course also provides students with specific techniques for practical applications in production and services.

38) Thiết kế mặt bằng hệ thống công nghiệp (Facility Layout)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** Không
- **Môn học trước:** IS103IU - Deterministic Models in OR
- **Mô tả nội dung môn học:** Thiết kế vị trí & Mặt bằng cung cấp sự giới thiệu toàn diện hợp lý về những phương pháp định lượng trong việc bố trí mặt bằng, tương phản với hầu hết các phương pháp định tính đang được sử dụng trong thực hành. Môn học cũng được thiết kế để cung cấp những công cụ và kỹ thuật cho sinh viên để giải quyết các bài toán liên quan. Ngoài ra, môn học cũng đem lại một cái nhìn bao quát và toàn diện về các bài toán đang được quan tâm trong Thiết kế vị trí và mặt bằng.
- **Mục tiêu của môn học:** Môn học này sẽ giới thiệu cho sinh viên những kiến thức cơ bản về thiết kế, bố trí, và định vị trí các thiết bị công nghiệp và các thiết bị khác. Sau khi hoàn thành môn học này, sinh viên sẽ hiểu được những vấn đề chủ yếu có liên quan đến những quyết định này, phương pháp tích hợp những vấn đề này vào mô hình toán học, và phương pháp giải quyết những mô hình này để thu được sự hiểu biết sâu sắc và ra những quyết định hợp lý.

39) Phân tích nâng cao dữ liệu lớn trong thương mại và công nghiệp (Advanced Industrial Big Data Analytics)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học này được thiết kế để tạo ra các kỹ sư thành thạo giải quyết vấn đề và ra quyết định trong kỹ thuật hệ thống công nghiệp. Sinh viên sẽ được cung cấp một khái niệm nâng cao về hệ thống công nghiệp và sản xuất. Môn học này bao gồm các chủ đề nâng cao bao gồm tổ chức và quản lý công nghiệp nâng cao, kỹ thuật sản xuất nâng cao, lập trình NC, tạo mẫu nhanh, sản xuất tích hợp máy tính và mô phỏng. Sinh viên sẽ được học để hiểu làm thế nào mô phỏng máy tính có thể được sử dụng như một công cụ hiệu quả để mô hình hóa và phân tích các hệ thống phức tạp. Phòng thí nghiệm sẽ chủ yếu giải quyết các khía cạnh thực tế của các lĩnh vực chính của sản xuất tiên tiến. Từ đó, sinh viên có thể giải quyết các vấn đề cơ bản trong lĩnh vực kỹ thuật hệ thống công nghiệp.

  This course is designed to produce engineers specializing in problem solving and decision-making functions. Students will be provided with an advanced concept of the Industrial and manufacturing system. This course covers advanced topics including Advanced Industrial organization and management, Advanced Manufacturing engineering, NC Programming, Rapid prototyping, Computer Integrated Manufacturing, and Simulation. To understand how computer simulation can be used as an effective tool to model and analyze complex systems. The laboratory shall primarily address the practical aspects of the key areas of advanced manufacturing. The students can solve basic problems in the field of ISE

40) Tiếng Anh trong nghiên cứu học thuật (Scientific Research Writing)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/ Môn học trước:** Không
- **Mô tả nội dung môn học:** Học phần này cung cấp cho sinh viên bậc đại học nền tảng toàn diện về quy trình nghiên cứu khoa học và kỹ năng truyền đạt kết quả nghiên cứu. Nội dung bao gồm các bước quan trọng trong quá trình thực hiện một nghiên cứu – từ việc xác định đề tài, tổng quan tài liệu, xây dựng phương pháp nghiên cứu, thu thập dữ liệu cho đến trình bày kết quả. Bên cạnh kỹ năng nghiên cứu, sinh viên cũng sẽ được rèn luyện cách viết báo cáo khoa học, trích dẫn tài liệu đúng chuẩn và trình bày kết quả nghiên cứu một cách hiệu quả bằng cả hình thức viết và thuyết trình.

  This course provides undergraduate students with a comprehensive introduction to the research process and scientific communication. It covers the key stages of conducting research—from identifying a topic and reviewing literature to designing methodology, collecting data, and presenting results. Alongside research skills, students will learn how to write technical reports, use proper citation practices, and communicate their findings effectively through written and oral presentations.

41) Vận trù học 2 – Các mô hình ngẫu nhiên (Probabilistic Models in OR)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** IS112IU - Engineering Probability & Statistics
- **Mô tả nội dung môn học:** Môn học trình bày các phương pháp định lượng và thống kê, được ứng dụng chủ yếu trong kỹ thuật ra quyết định. Các phương pháp được giới thiệu và tìm hiểu chi tiết bao gồm kiểm định giả thuyết thống kê, phân tích tương quan và hồi quy, dự báo, quy hoạch tuyến tính, phân tích cây ra quyết định, và quản lý dự án.

42) Quá trình sản xuất (Manufacturing Processes)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học nhằm mục đích giới thiệu cho sinh viên các khái niệm chính của quá trình sản xuất và phương pháp trong quá trình sản xuất.

43) Phân tích, thu thập số liệu và ứng dụng (Data Collection, Analysis and Applications)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Phân tích, thu thập số liệu và ứng dụng là môn học về: cách thu thập, sắp xếp, phân tích và trực quan hóa dữ liệu theo cách chính xác nhất. Cách thu thập dữ liệu, phân tích dữ liệu và trực quan hóa dữ liệu à một trong những kỹ năng, công cụ và khái niệm mà bạn cần để thành công trong tương lai bất kể chuyên ngành hiện tại của bạn là gì. Sinh viên sẽ học và thực hành cách xử lý dữ liệu một cách chuyên nghiệp và có trách nhiệm.

44) Hệ thống chuỗi cung ứng lạnh (Cold Chain Systems)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Sinh viên sẽ được cung cấp những kiến thức và kỹ năng cơ bản khái niệm, quy trình nghiệp vụ và các mô hình/công cụ cơ bản để giải quyết các vấn đề trong các giai đoạn khác nhau của hệ thống chuỗi cung ứng lạnh.

45) Kỹ năng Tính toán dành cho ngành Kỹ thuật (Engineering Computing Skills)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Học phần này được xây dựng nhằm trang bị cho sinh viên kiến thức nền tảng về công nghệ thông tin trong lĩnh vực kinh doanh. Nội dung môn học bao gồm giới thiệu về phần cứng và phần mềm kỹ thuật, hệ thống thông tin, cùng các công cụ quản lý dữ liệu hiện đại như Power BI và ngôn ngữ DAX.

Thông qua môn học, sinh viên sẽ được chuẩn bị hành trang kiến thức để có thể làm việc hiệu quả trong nhiều lĩnh vực, ngành nghề khác nhau.
This course is designed to combine knowledge of business information technologies. It explores engineering hardware and software as well as information systems. This study includes fundamentals of database management, Power BI, and DAX. The course will prepare students to work in a variety of industries.

46) Hệ thống thông minh (Intelligent Systems)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học này giới thiệu cho sinh viên về lĩnh vực Trí tuệ nhân tạo (AI), nhấn mạnh vào việc sử dụng nó để giải quyết các vấn đề trong thế giới thực mà các giải pháp khó thể hiện bằng cách sử dụng phương pháp thuật toán truyền thống. Nó khám phá lý thuyết cơ bản đằng sau các phương pháp phát triển hệ thống thể hiện hành vi thông minh bao gồm xử lý sự không chắc chắn, học hỏi kinh nghiệm và tuân theo các chiến lược giải quyết vấn đề được tìm thấy trong tự nhiên.
This course introduces students to the field of Artificial Intelligence (AI) with emphasis on its use to solve real world problems for which solutions are difficult to express using the traditional algorithmic approach. It explores the essential theory behind methodologies for developing systems that demonstrate intelligent behaviour including dealing with uncertainty, learning from experience and following problem solving strategies found in nature.

47) Hệ thống dữ liệu trong công nghiệp & thương mại (Industrial & Commercial Data Systems)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học này khám phá cách cơ sở dữ liệu được thiết kế, triển khai, sử dụng và duy trì, với trọng tâm là các ứng dụng công nghiệp và thương mại. Chúng tôi tập trung vào mô hình cơ sở dữ liệu quan hệ và tìm hiểu toán học của các truy vấn có cấu trúc.
This course explores how databases are designed, implemented, used and maintained, with an emphasis on industrial and commercial applications. We focus on the relational database model and learn the mathematics of structured queries.

48) Hệ thống thương mại điện tử (E-Commerce Systems)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Sinh viên sẽ được cung cấp đầy đủ kiến thức về lĩnh vực kinh doanh và các yếu tố công nghệ của thương mại điện tử (TMĐT). Ngoài ra, sinh viên sẽ có thể áp dụng kiến thức vào giải quyết các trường hợp thực tế.

49) Phân tích dữ liệu dự đoán và ứng dụng (Predictive Data Analytics and Applications)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học nhằm mục đích cung cấp kiến thức cho sinh viên về cách đưa ra dự đoán bằng các phương pháp kỹ thuật. Mặc dù các nhà khoa học đã quen với việc đưa ra dự đoán dựa trên các lý thuyết đã được thống nhất và chấp nhận, nhưng ngày nay, phân tích dữ liệu lớn có thể đưa ra dự đoán dựa trên việc thực hiện một chuỗi các bước xử lý dữ liệu. Môn học giải thích cả quy trình phân tích cũng như các kỹ thuật để đưa ra dự đoán. Môn học học về phân tích dự đoán rộng, đồng thời xác định một số thách thức chính phải đối mặt. Các kỹ thuật được chọn từ dự đoán dựa trên thông tin và dựa trên các lỗi, chuỗi thời gian, ANN và phương pháp nghiên cứu sâu sẽ được nghiên cứu trong môn học với các ví dụ và trường hợp cụ thể.

  The Predictive Analytics course is aimed at providing knowledge to the students on how to make prediction using machine learning techniques. While scientists are accustomed to make predictions based on consolidated and accepted theories, nowadays big data analytics is able to deliver predictions based on executing a sequence of data processing steps. The course explains both the analytics process as well as the techniques for making predictions. The course takes a broad predictive analytics project perspective, while identifying some of the key challenges faced, while making predictions. Selected techniques from the information-based and error-based prediction, time series, ANN and deep learning approaches will be studied in the course with supporting examples and use cases.

50) Các hệ thống sản xuất thông minh (Smart Manufacturing Systems)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học này truyền đạt cho sinh viên về kiến thức thuộc sản xuất thông minh cho công nghiệp 4.0 giúp sinh viên sáng tạo trong công việc, điều hành trong lĩnh vực sản xuất.

  Impart knowledge of smart manufacturing for industry 4.0 for making student innovative.

51) Phân tích quyết định (Decision Analytics)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học nhằm mục đích giới thiệu cho sinh viên các khái niệm chính và phương pháp tiếp cận cơ bản trong phân tích định lượng và cung cấp nền tảng cho mô hình phân tích quyết định.

To introduce students to key concepts and fundamental approaches in quantitative analysis, and provide a foundation for decision-analytic modeling.

52) Kỹ thuật hệ thống (Systems Engineering)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Kỹ thuật hệ thống là môn học các phương pháp để phát triển và phân tích các hệ thống. Môn học này cung cấp kiến thức và kỹ năng cần thiết cho các kỹ sư trong quy trình phát triển và phân tích hệ thống (sản xuất và dịch vụ): quy trình kỹ thuật hệ thống, phương pháp đánh giá, lựa chọn và tích hợp các thành phần hệ thống, mô phỏng hệ thống và đánh giá độ tin cậy, tính sẵn sàng và khả năng phục vụ của các hệ thống.
  Systems Science is the course of methods to develop and analyze the systems. This course provides the knowledge and skills necessary for the engineers in the development process and systems analysis (manufacturing and services): systems engineering processes, methods of evaluation, selection and integration of system components, system simulation, and assessment of reliability, availability, and serviceability of the systems.

53) Vận chuyển Quốc tế (International Transportation & Logistics)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Học sinh học về tầm quan trọng của dịch vụ logistics và vận chuyển quốc tế. Sinh viên sẽ được học các phương pháp và ứng dụng cơ bản về vận trù học để triển khai, vận hành và tối ưu hóa toàn bộ mạng lưới nguyên vật liệu của công ty các tài liệu công ty. Điều này đặc biệt được áp dụng trong việc sắp xếp tối ưu các nguồn và dòng nguyên vật liệu cũng như các mối liên kết tối ưu của chúng dưới góc nhìn của công nghệ vận chuyển. Các chủ đề gồm có: những yêu cầu cho các công ty logistics; hoạt động trong vận tải hàng hóa đường bộ, đường sắt, hàng không và vận tải biển; cạnh tranh trong vận tải quốc tế; kế toán chi phí cho giao nhận vận tải; định giá trong vận tải hàng hóa đường bộ, đường sắt, hàng không và vận tải biển; quản lý thông tin trong giao nhận vận tải…
  Students learn the significance of international traffic and transport logistics. Students will learn basic methods and applications of operations research to implement, operate and optimize overall company material flow technical networks. This applies in particular to the subject of the optimal arrangement of sources and outflows and their dimension as well as their optimal interconnection from a transport technology point of view. Topics include: requirements for logistics companies; active in road freight, rail, air and sea transport; competition in international transport; competition in international transport; cost accounting for

freight forwarding; price setting in road freight, rail, air and sea transport; information management in freight forwarding…

54) Thương mại điện tử trong Logistics và Chuỗi cung ứng (E-Logistics in Supply chain management)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Các nguyên lý Logistics & quản lý chuỗi cung ứng. Đào sâu nghiên cứu vai trò của thương mại điện tử trong việc tạo ra mối quan hệ hợp tác giữa các nhà vận tải và phân phối nhằm dụng tối đa nguồn lực sẵn có của các đối tác. Sự tương thích giữa công nghệ và hạ tầng vận tải, cơ cấu kiểm soát dòng vật tư và thông tin giữa bên mua và bên bán, cũng như đồng bộ hóa hệ thống giữa các bên được đặc biệt nhấn mạnh. Ngoài ra, môn học cũng cung cấp các công cụ hỗ trợ đắc lực để tạo ra giá trị trong toàn bộ chuỗi cung ứng.
  Comprehensive inquiry into the role of e-commerce in collaborative distribution and logistics relationships. Special attention is afforded to resource and technology interdependencies, exchange governance mechanisms and relationship management bench-marking. Emphasis is given to the tools for creating value in the supply chain.

55) Kỹ năng Lãnh đạo (Leadership)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học cung cấp kiến thức về phát triển tổ chức và học tập; dẫn dắt tổ chức học tập; lý thuyết lãnh đạo và các quan điểm, như phỏng theo mô hình (followership), phát triển lãnh đạo; huấn luyện và cố vấn; dẫn dắt các đội và nhóm, lãnh đạo và sự đa dạng của tổ chức.
  Organisational development and learning; leading learning organisations; leadership theories and perspectives, followership, leadership development; coaching and mentoring; leading groups and teams, leadership and diversity.

56) Hệ thống sản xuất linh hoạt (Flexible Manufacturing Systems)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** Không
- **Môn học trước:** IS085IU - CAD/CAM/CNC
- **Mô tả nội dung môn học:** Môn học này cung cấp cho sinh viên sự hiểu biết sâu rộng về các hệ thống động để phân tích, dự báo, và xác định hiệu suất của một hệ thống kỹ thuật. Môn học này bao gồm: thiết kế các bộ điều khiển phản hồi cổ điển theo thời gian – bằng phương pháp Root – Locus, hoặc theo tần số, giới thiệu về điều khiển kỹ thuật số và các vấn đề thực hiện có liên quan. Thông qua các thí

nghiệm, sinh viên sẽ thu được các kinh nghiệm về thiết kế các bộ điều khiển phản hồi kỹ thuật số và tương tự.

- **Mục tiêu của môn học:** Mục tiêu của môn học này là nhằm giúp sinh viên hiểu được các yếu tố của lý thuyết điều khiển cơ bản. Đặc biệt, sinh viên sẽ hiểu rõ những chủ đề sau: khái niệm về phản hồi và các đặc tính của phản hồi, khái niệm về tính ổn định và giới hạn của độ ổn định, và những công cụ khác nhau để phân tích các khái niệm đã đề cập ở trên. Môn học này cũng giúp sinh viên đạt được kiến thức về các kỹ thuật thiết kế tuyến tính cơ bản.

57) Advanced Modeling & Prototyping (Mô hình hóa và tạo mẫu nâng cao)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Môn học được thiết kế với mục tiêu giảng dạy cho sinh viên các công nghệ tạo mẫu ảo, quản lý dữ liệu sản phẩm (PDM), kỹ thuật đảo ngược (RE) và tạo mẫu nhanh (RP) và các ứng dụng của chúng trong phát triển sản phẩm.

  To teach students the virtual prototyping, product data management (PDM), reverse engineering (RE) and rapid prototyping (RP) technologies and their applications in product development.

58) Industrial Process, System Data Analysis and Modelling (Hệ thống dữ liệu công nghiệp & thương mại)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Mô hình hóa dữ liệu hệ thống và quy trình là một trong những khía cạnh chính của kỹ thuật hệ thống quy trình. Đây là một hoạt động quan trọng ở hầu hết các công ty lớn trên thế giới, được thúc đẩy bởi các ứng dụng như tối ưu hóa quy trình, thiết kế và kiểm soát. Môn học trình bày một cách tiếp cận có hệ thống để mô hình hóa bao gồm xây dựng mô hình, tài liệu, phân tích, giải pháp và xác nhận. Các mô hình không chỉ phụ thuộc vào bản thân quy trình mà còn phụ thuộc vào mục tiêu của mô hình hóa. Do đó, môn học này tập trung chủ yếu vào phân tích và mô hình hóa dữ liệu hệ thống và quy trình cho mục đích mô phỏng động và kiểm soát quy trình. Môn học này giới thiệu một phương pháp mô hình hóa có cấu trúc nhấn mạnh tầm quan trọng của mục tiêu mô hình hóa và bao gồm các bước chính như xác minh mô hình, hiệu chuẩn và xác nhận. Tập trung vào các kỹ thuật lập mô hình mới và nâng cao như mô hình hóa rời rạc, kết hợp, phân cấp và theo kinh nghiệm. Minh họa các khái niệm, công cụ và kỹ thuật mô hình hóa quy trình bằng các ví dụ và ứng dụng nâng cao.

  Industrial Process, System Data Analysis and Modelling is one of the key aspects of process systems engineering. It is a significant activity in most major companies around the world, driven by applications such as process optimization, design, and

control. It presents a systematic approach to modelling covering model formulation, documentation, analysis, solution, and validation. Process models depend not only on the process itself, but also on the modelling goal. This course therefore, places its main emphasis on Industrial Process, System Data Analysis and Modelling for dynamic simulation and process control purposes. This course introduces a structured modelling methodology emphasizing the importance of the modelling goal and including key steps such as model verification, calibration, and validation. Focuses on novel and advanced modelling techniques such as discrete, hybrid, hierarchical, and empirical modelling. Illustrates the notions, tools, and techniques of process modeling with examples and advances applications.

59) Quản lý bán lẻ (Retail Management)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** không
- **Mô tả nội dung môn học:** Môn học cung cấp cho sinh viên với một cái nhìn toàn diện về bán lẻ và ứng dụng của các khái niệm tiếp thị trong một môi trường quản lý bán lẻ thực tế. Như một người quản lý tiếp thị tiềm năng, môn học này sẽ cung cấp cho sinh viên cái nhìn sâu sắc vào môi trường bán lẻ mà sinh viên sẽ là một phần và cho phép sinh viên đưa ra quyết định trong sự tương tác với các nhà bán lẻ. Môn học cũng cung cấp một nền tảng tốt cho những người quan tâm đến việc sở hữu hoặc điều hành một doanh nghiệp bán lẻ nhỏ hoặc những người quan tâm theo đuổi sự nghiệp bán lẻ như một người mua hàng hóa, quản lý cửa hàng.
  This course provides the student with a comprehensive view of retailing and an application of marketing concepts in a practical retail managerial environment. As a potential marketing manager, this course will give students insight into the retailing environment of which students will be a part and allow students to make informed decisions in your interaction with retailers. The course also provides a good foundation for those interested in owning or running a small retail business or those interested in pursuing a retail career as a merchandise buyer or store manager.

60) Khai phá dữ liệu trong chuỗi cung ứng (Data mining in Supply chain)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Khai thác dữ liệu dùng để chỉ một nhóm các kỹ thuật được sử dụng để phát hiện các mối quan hệ thú vị của dữ liệu.Với sự khả dụng của đại cơ sở dữ liệu dùng để lưu trữ, quản lý và đồng hóa dữ liệu, sự đột phá mới của khai thác dữ liệu là nơi gặp gỡ của các hệ thống cơ sở dữ liệu, trí tuệ nhân tạo và các thuật toán phân tích dữ liệu có hiệu quả. Tính chất phân tán của một số cơ sở dữ liệu, kích thước và độ phức tạp cao của nhiều kỹ thuật giới thiệu những thách thức tính toán thú vị. Môn học cung cấp kiến thức tổng quan về hệ thống kinh doanh

thông minh trong lĩnh vực quản lý chuỗi cung ứng và tiếp thị; Giải quyết như thế nào để tận dụng hệ thống kinh doanh thông minh để xác định tiêu chí, làm sắc nét tính chính xác của dự báo và lập kế hoạch, theo dõi hoạt động kinh doanh và cung cấp biểu đồ, bảng điểm, báo cáo chiến lược, báo cáo hoạt động và / thời gian thực để nâng cao ra quyết định cho chuỗi cung ứng và tiếp thị. SAP-giải pháp kinh doanh thông minh được giới thiệu để minh họa cho khái niệm.

Data mining refers to a family of techniques used to detect interesting nuggets of relationships/knowledge in data. With the availability of large databases to store, manage and assimilate data, the new thrust of data mining lies at the intersection of database systems, artificial intelligence and algorithms that efficiently analyze data. The distributed nature of several databases, their size and the high complexity of many techniques present interesting computational challenges. An overview of business intelligence in the field of supply chain management and marketing. Addresses how to leverage business intelligence systems to define KPIs, sharpen the accuracy of forecasting and planning, track business activities, and deliver dashboards, scorecards, strategic reporting, and operational/real-time reporting to enhance decision making for supply chain and marketing. SAP business intelligence solution is introduced to illustrate the concepts store, manage and assimilate data, the new thrust of data mining lies at the intersection of database systems, artificial intelligence and algorithms that efficiently analyze data. The distributed nature of several databases, their size and the high complexity of many techniques present interesting computational challenges.

61) Thực tập 1 (Internship 1)

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Khóa học này là một khóa thực tập và được thiết kế để bổ sung thêm cho phương pháp học tập theo truyền thống và thực nghiệm. Kỳ thực tập cung cấp cho sinh viên cơ hội để áp dụng thực tế kiến thức thu được trong Khoa Kỹ thuật Quản lý Công Nghiệp. Thực tập được cử đến các cơ quan, bao gồm các công ty nước ngoài, cơ quan chính phủ và các doanh nghiệp tư nhân. Sinh viên cần tối thiểu 15 ngày làm việc (5 ngày tham quan nhà máy, 5 ngày viết báo cáo, 5 ngày nhận sự chấp thuận của người giám sát).

  This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering. Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor). Whether the students have arranged their internship themselves or have been assisted in arranging one by the

program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company.

62) Thực tập 2 (Internship 2)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Khóa học này là một khóa thực tập và được thiết kế để bổ sung cho việc học tập trên lớp với phương pháp truyền thống và thực nghiệm. Khóa thực tập cung cấp cho sinh viên cơ hội để áp dụng thực tế kiến thức thu được ở Nhà trường. Kỳ thực tập được thực hiện trong các công ty, ví dụ như công ty nước ngoài, cơ quan chính phủ và các ngành công nghiệp tư nhân. Sinh viên được yêu cầu tối thiểu 320 giờ làm việc hoặc 40 ngày làm việc. Các sinh viên tự sắp xếp kỳ thực tập của họ hoặc được giảng viên hướng dẫn/khoa hỗ trợ sắp xếp để hoàn thành khóa học thực tập.

  This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering. Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor). Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company.

63) Thiết kế Đồ án (Capstone Design)

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Không
- **Mô tả nội dung môn học:** Đồ án là một môn học kéo dài một học kỳ được thực hiện vào năm cuối. Sinh viên tham gia vào một dự án nghiên cứu tập trung vào các vấn đề kinh tế, xã hội và môi trường để nghiên cứu một hệ thống hiện tại, xác định vấn đề có thể và khám phá các thành tựu nghiên cứu đã được công bố trong một lĩnh vực nghiên cứu mà sinh viên đã đồng ý với các cố vấn luận án để hỗ trợ và phát triển trong luận án sau này. Môn học này là dự án cá nhân. Kết quả là, sinh viên phải phát triển một mô-đun hoặc hệ thống nguyên mẫu với các yêu cầu cấp độ cơ bản mà sinh viên có thể cải thiện và phát triển trong luận án.

  Capstone project is a semester-long course taken at the senior year. Students engage

in a research project focused on economic, social and environmental problems to study a current system, identify the possible problem, and explore in literature published research achievements in a research field that students have already agreed upon with potential thesis advisors in order to support and develop in thesis later. This research is individual work. Students and advisors meet to discuss together as much as needed. In the result, students have to develop a prototype module or system with the basic level requirements that it can improve and develop in the thesis.

64) Luận văn tốt nghiệp (Thesis)

- **Số tín chỉ:** 10 tín chỉ (Lý thuyết: 10, Thực hành: 0)
- **Điều kiện tiên quyết/ Môn học trước:** Không
- **Mô tả nội dung môn học:** Luận văn tốt nghiệp là một nghiên cứu cá nhân kéo dài một học kỳ vào học kỳ cuối cùng của năm cuối. Học sinh được yêu cầu giải quyết một vấn đề quy mô lớn bằng cách thiết kế một hệ thống mới hoặc phát triển một giải pháp toàn diện để cải thiện hệ thống hiện tại. Thiết kế mới hoặc giải pháp cải tiến phải tính đến các hạn chế thực tế như điều kiện kinh tế, xã hội và môi trường.

TRƯỞNG KHOA	**KT. HIỆU TRƯỞNG** **PHÓ HIỆU TRƯỞNG**
NGUYỄN VĂN HỢP	**ĐINH ĐỨC ANH VŨ**

ĐẠI HỌC QUỐC GIA
THÀNH PHỐ HỒ CHÍ MINH
TRƯỜNG ĐẠI HỌC QUỐC TẾ

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

PHỤ LỤC 1:
NỘI DUNG ĐIỀU CHỈNH CHƯƠNG TRÌNH ĐÀO TẠO NGÀNH KỸ THUẬT HỆ THỐNG CÔNG NGHIỆP KHÓA 2025 SO VỚI KHÓA 2024

(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2025 của Hiệu trưởng trường Đại học Quốc tế)

1. **Các môn học loại bỏ khỏi chương trình đào tạo**
   - ***Bỏ các môn bắt buộc sau:*** Chemistry Laboratory, CH012IU, 1TC; Critical Thinking, PE008IU, 3TC; Physics 3, PH015IU, 3TC; Calculus 3, MA023IU, 4TC; Scientific Writing, IS079IU, 2TC; Time Series & Forecasting Techniques, IS104IU, 2TC; Data Collection, Analysis, and Applications, IS092IU, 3TC; Capstone 1, IS111IU, 3TC.
   - ***Bỏ các môn học sau khỏi Nhóm tự chọn chuyên ngành:*** Experimental Design, IS031IU, 3TC; Advanced Industrial Big Data Analytics and AI Applications for Industry and Supply Chain, IS096IU, 3TC.
   - ***Bỏ các môn học sau khỏi Nhóm tự chọn chuyên ngành:*** Multi-Criteria Decision Making, IS033IU, 3TC; Facility Layout, IS032IU, 3TC.
   - ***Bỏ các môn học sau khỏi Nhóm tự chọn số 02:*** Creative Thinking, IS080IU, 3TC.
   - ***Bỏ môn học sau khỏi Nhóm tự chọn tự do:*** Environmental Science, PE014IU, 3TC; Ethics and professional skills for engineers, PE020IU, 3TC; Business Computing Skills, BA120IU, 3TC.

2. **Các môn học bổ sung vào chương trình đào tạo**
   - ***Thêm môn bắt buộc sau:*** Engineering Ethics and Critical Thinking, PE022IU, 3TC; Time Series & Forecasting Techniques, IS058IU, 3TC; Experimental Design, IS031IU, 3TC; Advanced Industrial Big Data Analytics and AI

Applications for Industry and Supply Chain, IS096IU, 3TC; Multi-Criteria Decision Making, IS033IU, 3TC; Facility Layout, IS032IU, 3TC; Capstone Design, IS083IU, 3TC.

- ***Thêm các môn học sau vào Nhóm tự chọn số 01:*** Data Collection, Analysis, and Applications, IS092IU, 3TC; Engineering Computing Skills, IS113IU, 3TC.
- ***Thêm các môn học sau vào Nhóm tự chọn số 02:*** Scientific Research Writing, IS114IU, 3TC.
- ***Thêm các môn học sau vào Nhóm tự chọn số 05:*** Organizational Behavior**,** BA130IU, 3TC; Sales Management, BA032IU, 3TC; Principles Of Marketing, BA003IU; Human Resources Management, BA156IU, 3TC.

3. Các điều chỉnh khác

- Môn Introduction to computing đổi mã môn IS086IU thành IS115IU do thay đổi lớn hơn 60% nội dung trong syllabus từ ngôn ngữ Matlab sang ngôn ngữ Python.
- Cập nhật lại tất cả các syllabus trong chương trình đào tạo khóa 2025.

4. Hướng xử lý cho các sinh viên khóa cũ khi chưa học các môn học bị loại bỏ khỏi chương trình đào tạo

- Đối với môn Scientific Writing, IS079IU, 2TC: Khoa sẽ đề xuất thay thế bằng môn Scientific Research Writing, IS114IU, 3TC.
- Đối với môn Time Series & Forecasting Techniques, IS104IU, 2TC: Khoa sẽ đề xuất thay thế bằng môn Time Series & Forecasting Techniques, IS058IU, 3TC.
- Đối với môn Capstone 1, IS111IU, 3TC: Khoa sẽ đề xuất thay thế bằng môn Capstone Design, IS083IU, 3TC.
- Đối với môn Introduction to computing, IS086IU, 3TC: Khoa sẽ đề xuất thay thế bằng môn Introduction to computing, IS115IU, 3TC

ĐẠI HỌC QUỐC GIA
THÀNH PHỐ HỒ CHÍ MINH
TRƯỜNG ĐẠI HỌC QUỐC TẾ

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

PHỤ LỤC 2:
ĐỀ CƯƠNG CHI TIẾT CÁC MÔN HỌC

(Sắp xếp đúng thứ tự môn học Bảng 9 – Nội dung CTĐT)

(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2025 của Hiệu trưởng trường Đại học Quốc tế)

ĐẠI HỌC QUỐC GIA THÀNH PHỐ HỒ CHÍ MINH
KHOA CHÍNH TRỊ - HÀNH CHÍNH

ĐỀ CƯƠNG CHI TIẾT MÔN HỌC
(Dành cho trường Đại học Quốc Tế)

1. Thông tin tổng quát

- Tên môn học:
  - Tiếng Việt: **Triết học Mác-Lênin**
  - Tiếng Anh: Philosophy of Marxism – Leninism
- Mã số môn học: PE015IU
- Thuộc khối kiến thức/kỹ năng:

☒ Kiến thức cơ bản/giáo dục đại cương ☐ Kiến thức cơ sở ngành
☐ Kiến thức chuyên ngành ☐ Kiến thức khác
☐ Môn học chuyên về kỹ năng chung ☐ Môn học đồ án/luận văn tốt nghiệp

- Số tín chỉ: 03
  - Lý thuyết: *30 (trên lớp)*
  - Thực hành (thuyết trình): *15 (trên lớp)*, *90 (về nhà)*
- Môn học tiên quyết: Không
- Môn học trước: Không
- Môn học song hành: Không

2. Mô tả môn học

(vị trí của môn học đối với chương trình đào tạo (CTĐT), những mục đích và nội dung chính yếu của môn học)

Môn học thuộc phần kiến thức giáo dục đại cương thuộc mảng lý luận chính trị, trang bị cho sinh viên những kiến thức cơ bản về triết học Mác-Lênin. Môn học nghiên cứu những quy luật vận động, phát triển chung nhất của tự nhiên, xã hội, tư duy; gồm 3 chương: Triết học và vai trò của triết học trong đời sống xã hội, chủ nghĩa duy vật biện chứng và chủ nghĩa duy vật lịch sử.

3. Tài liệu học tập

(Các giáo trình, tài liệu tham khảo, các phần mềm, không quá 5 cuốn)

Giáo trình:

[1] Bộ Giáo dục và Đào tạo (2021), *Giáo trình Triết học Mác – Lênin,* (dùng cho khối không chuyên ngành lý luận chính trị), Nxb. Chính trị quốc gia, Hà Nội.

[2] Bộ Giáo dục và Đào tạo (2012), *Giáo trình Những Nguyên lý cơ bản của chủ nghĩa Mác – Lênin,* Nxb. Chính trị quốc gia, Hà Nội.

[3] Hội đồng Trung ương (2008), *Giáo trình Triết học Mác-Lênin*, Nxb. Chính trị quốc gia, Hà Nội.

Tài liệu khác:

[1] Triết học Mác-Lênin (Bộ câu hỏi hướng dẫn ôn thi môn triết học), Nxb Sự thật, Hà Nội, 1980

[2] Triết học Mác-Lênin, tập 1 và 2, Nxb Sách giáo khoa Mác - Lênin, Hà Nội, 1995

Phần mềm:

4. Mục tiêu môn học

(các mục tiêu tổng quát của môn học, thể hiện sự liên quan với các chuẩn đầu ra (X.x.x) của CTĐT và trình độ năng lực (TĐNL)được phân bổ cho môn học)

Mục tiêu (1)	Mô tả mục tiêu (2)	CĐR của môn học tương ứng CTĐT (3)	TĐNL tương ứng CTĐT (4)
G1	***4.1 Về kiến thức*** Sinh viên **hiểu** được vai trò của triết học Mác - Lênin trong đời sống xã hội và những nội dung cơ bản về: Chủ nghĩa duy vật biện chứng và chủ nghĩa duy vật lịch sử.		
G2	***4.2. Về kỹ năng*** Sinh viên **vận dụng, phân tích** được những tri thức cơ bản của triết học Mác - Lênin về chủ nghĩa duy vật biện chứng và chủ nghĩa duy vật lịch sử vào việc nhận thức, lý giải các hiện tượng, quy luật trong đời sống xã hội Việt Nam và thế giới.		
G3	***4.3. Về thái độ/năng lực tự chủ và trách nhiệm*** Sinh viên **đánh giá** được giá trị, tính khoa học cách mạng và nhân văn của triết học Mác - Lênin đối với thực tiễn Việt Nam và nhân loại		

(1): Ký hiệu mục tiêu của môn học.

(2): Mô tả các mục tiêu bao gồm các động từ chủ động, các chủ đề CĐR (X.x.x) và bối cảnh áp dụng tổng quát

(3), (4): Ký hiệu CĐR của CTĐT và TĐNL tương ứng được phân bổ cho môn học.

5. Chuẩn đầu ra môn học

(các mục cụ thể hay CĐR của môn học và mức độ giảng dạy I, T, U)

CĐR (1)	Mô tả CĐR (2)	Mức độ giảng dạy (3)
G1.1	Sinh viên hiểu những tri thức cơ bản về triết học nói chung, những điều kiện ra đời của triết học Mác – Lênin. Đồng thời giúp sinh viên phân tích, đánh giá được thực chất cuộc cách mạng trong triết học do C.Mác và Ph.Ăngghen thực hiện và các giai đoạn hình thành, phát triển triết học Mác – Lênin; Vai trò của triết học Mác trong đời sống xã hội và trong thời đại ngày nay.	I, T
G1.2	Sinh viên hiểu được quan điểm của chủ nghĩa duy vật biện chứng về vật chất, các hình thức, phương thức tồn tại của vật chất; nguồn gốc, bản chất của ý thức; mối quan hệ biện chứng giữa vật chất và ý thức.	I.T. U

	Sinh viên hiểu được những nội dung cơ bản của phép biện chứng duy vật; ý nghĩa phương pháp luận trong nhận thức và thực tiễn. Sinh viên hiểu những kiến thức cơ bản về lý luận nhận thức của chủ nghĩa duy vật biện chứng; ý nghĩa phương pháp luận.	
G1.3	Sinh viên hiểu những kiến thức về học thuyết hình thái kinh tế - xã hội; vận dụng ý nghĩa phương pháp luận vào thực tiễn của Việt Nam. Giúp sinh viên hiểu được những quan điểm cơ bản của triết học Mác – Lênin về giai cấp; về nhà nước và cách mạng xã hội; về dân tộc, quan hệ giai cấp - dân tộc – nhân loại; ý nghĩa phương pháp luận trong nhận thức những vấn đề cơ bản của cách mạng Việt Nam. Sinh viên hiểu những quan điểm cơ bản của triết học Mác – Lênin về con người, về ý thức xã hội, sự vận dụng vào cách mạng Việt Nam.	I, T, U
G2.1	Sinh viên phân tích mang tính khái quát hóa để rút ra *Từ khóa tri thức* đối với mỗi nội dung và tư duy có hệ thống.	U
G2.2	Sinh viên vận dụng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn.	U
G2.3	Sinh viên vận dụng trong giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức và kinh nghiệm, khả năng điều hành nhóm làm việc.	U
G3.1	Sinh viên phân tích, đánh giá được những nền tảng khoa học và cách mạng của chủ nghĩa duy vật biện chứng và chủ nghĩa duy vật lịch sử.	U
G3.2	Sinh viên vận dụng lập trường mácxít nhằm đấu tranh chống lại các quan điểm sai trái, xuyên tạc triết học Mác – Lênin.	U

(1): Ký hiệu CĐR của môn học

(2): Mô tả CĐR, bao gồm các động từ chủ động, các chủ đề CĐR ở cấp độ 4 (X.x.x.x) và bối cảnh áp dụng cụ thể.

(3): I (Introduce): giới thiệu; T (Teach): dạy; U (Utilize): sử dụng

6. Đánh giá môn học

(các thành phần, các bài đánh giá, các tiêu chí đánh giá, chuẩn đánh giá, và tỷ lệ đánh giá, thể hiện sự tương quan với các CĐR của môn học)

Thành phần đánh giá (1)	**Bài đánh giá (2)**	**CĐR môn học (3)**	**Tỷ lệ % (4)**
A1. Đánh giá quá trình	- Chuyên cần (A1.1) - Tham gia học tập trên lớp tích cực, hăng hái phát biểu (A1.2) - Thuyết trình nhóm (A1.3)	G1.1, G1.2-G1.3, G2.1, G2.2-G2.3 G3.1-	30%

		G3.2	
A2. Đánh giá giữa kỳ	Hình thức tự luận hoặc trắc nghiệm (A2.1)	G1.1 G2.1-G2.2, G3.1-G3.2	20%
A3. Đánh giá cuối kỳ	- Hình thức tự luận, sinh viên được sử dụng tài liệu giấy, không sử dụng thiết bị nối mạng khi làm bài thi: 75 phút (A3.1) - Điểm thưởng (tối đa 20% của điểm cuối kỳ)	G1.2-G1.3, G2.1-G2.2, G3.1-G3.2	50%

(1): các thành phần đánh giá của môn học.
(2): các bài đánh giá
(3): các CĐR được đánh giá.
(4): tiêu chí đánh giá.
(5): chuẩn đánh giá
(6): Tỷ lệ điểm của các bài đánh giá trong tổng điểm môn học

7. Kế hoạch giảng dạy chi tiết

(các nội dung giảng dạy theo buổi học, thể hiện sự tương quan với các CĐR của môn học, các hoạt động dạy và học (ở lớp, ở nhà) và các bài đánh giá của môn học)

Lý thuyết

1	Nội dung (2)	CĐR môn học (3)	Hoạt động dạy và học (4)	Bài đánh giá (5)
1/3 tiết	**Giới thiệu về môn học** **Chương 1** **TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI** I. triết học và vấn đề cơ bản của triết học *1. Khái lược về triết học* - Nguồn gốc ra đời của triết học *1. Khái lược về triết học*	G1.1	**Hoạt động dạy**: - Giới thiệu đề cương môn học - Giới thiệu nội dung đề tài thuyết trình nhóm) - Trình chiếu, thuyết giảng **Hoạt động học**: - Chia nhóm - Giới thiệu nhóm học tập - Nghe giảng, phát biểu - Đọc trước mục I, II của chương 1	A1.1, A1.2, A2.1, A3.1
2/3 tiết	**Chương 1** **TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI**	G1.1 G2.2 G2.3	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**:	A1.1, A1.2, A2.1, A3.1

	I. Triết học và vấn đề cơ bản của triết học (tt) 1. Khái lược về triết học - Khái niệm triết học *2. Vấn đề cơ bản của triết học*		- Nghe giảng, phát biểu - Phác thảo nội dung thuyết trình nhóm - Đọc trước phần I, mục 3, chương 1.	
3/3 tiết	**Chương 1** **TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI (tiếp theo)** I. Triết học và vấn đề cơ bản của triết học (tt) *3. Biện chứng và siêu hình*	G1.1 G2.2 G2.3	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu - Phác thảo nội dung thuyết trình nhóm - Đọc trước phần II chương 1.	A1.1, A1.2, A2.1, A3.1
4/3 tiết	**Chương 1** **TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI (tiếp theo)** II. Triết học Mác - Lênin và vai trò của triết học Mác - Lênin trong đời sống xã hội *1. Sự ra đời và phát triển của triết học Mác - Lênin* *- Giới thiệu nội dung mục 2.3*	G1.1 G2.2 G2.3	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu - Phác thảo nội dung thuyết trình nhóm - Đọc trước phần I chương 1.	A1.1, A1.2, A2.1, A3.1
5/3 tiết	**Chương 2** **CHỦ NGHĨA DUY VẬT BIỆN CHỨNG** I. Vật chất và ý thức *1. Vật chất và các hình thức tồn tại của vật chất* *2. Nguồn gốc, bản chất và kết cấu của ý thức*	G1.2 G2.1 G.2.2 G3.1 G3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình. - Đọc trước mục 3 phần I chương 2.	A1.1, A1.2, A2.1, A3.1
6/3 tiết	**Chương 2** **CHỦ NGHĨA DUY VẬT BIỆN CHỨNG** I. Vật chất và ý thức *3. Mối quan hệ giữa vật chất và ý thức* II. Phép biện chứng duy vật *1. Hai loại hình biện chứng và phép biện chứng duy vật*	G1.2 G2.1 G.2.2 G3.1 G3.2 G1.3	- Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình. - Đọc trước mục 1,2 phần II chương 2.	A1.1, A1.2, A2.1, A3.1
7/3 tiết	**Chương 2** **CHỦ NGHĨA DUY VẬT BIỆN**	G1.3 G2.1	**Hoạt động dạy**: - Trình chiếu, thuyết	A1.1, A1.2,

	CHỨNG (tiếp theo) II. Phép biện chứng duy vật *2. Nội dung của phép biện chứng duy vật* *a. Hai nguyên lý.* *- Nguyên lý về mối liên hệ phổ biến* *- Nguyên lý về sự phát triển* **- Kiểm tra giữa kỳ**	G.2.2 G3.1 G3.2	giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình. - Đọc trước mục 2 phần II chương 2.	A3.1
8/3 tiết	Chương 2 **CHỦ NGHĨA DUY VẬT BIỆN CHỨNG (tiếp theo)** **II. Phép biện chứng duy vật** **2. Nội dung của phép biện chứng duy vật** *c. Các cặp phạm trù của PBCDV* *- Phạm trù cái riêng – cái chung* *- Phạm trù nguyên*	G1.3 G2.1 G.2.2 G3.1 G3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình. - Đọc trước mục 2 phần II chương 2.	A1.1, A1.2, A3.1
9/3 tiết	**Chương 2** **CHỦ NGHĨA DUY VẬT BIỆN CHỨNG (tiếp theo)** II. Phép biện chứng duy vật *2. Nội dung của phép biện chứng duy vật* *c. Ba quy luật:* *- Quy luật Lượng – Chất.* *- Quy luật thống nhất và đấu tranh của các mặt đối lập*	G1.3 G2.1 G.2.2 G3.1 G3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình. - Đọc trước phần III chương 2.	A1.1, A1.2, A3.1
10/3 tiết	**Chương 2** **CHỦ NGHĨA DUY VẬT BIỆN CHỨNG (tiếp theo)** III. Lý luận nhận thức *1. Các nguyên tắc của lý luận nhận thức duy vật biện chứng* *2. Nguồn gốc, bản chất của nhận thức* *3. Thực tiễn và vai trò của thực tiễn đối với nhận thức* *- Giới thiệu mục 4.5*	G1.3 G2.1 G.2.2 G3.1 G3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình. - Đọc trước phần I chương 3.	A1.1, A1.2, A3.1
11/3 tiết	**Chương 3** **CHỦ NGHĨA DUY VẬT LỊCH SỬ** I. Học thuyết hình thái kinh tế - xã hội *1. Sản xuất vật chất là cơ sở của sự tồn tại và phát triển xã hội*	G1.4 G2.1 G.2.2 G3.1 G3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình.	A1.1, A1.2, A3.1

	2. Biện chứng giữa lực lượng sản xuất và quan hệ sản xuất		- Đọc trước mục 3.4 phần I chương 3.	
12/3 tiết	**Chương 3** **CHỦ NGHĨA DUY VẬT LỊCH SỬ** I. Học thuyết hình thái kinh tế - xã hội *3. Biện chứng giữa cơ sở hạ tầng và kiến trúc thượng tầng của xã hội* *4. Sự phát triển các hình thái kinh tế - xã hội là một quá trình lịch sử - tự nhiên*	G1.4 G2.1 G.2.2 G3.1 G3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình. - Đọc trước phần II và phần III chương 3.	A1.1, A1.2, A1.3, A3.1
13/3 tiết	**Chương 3** **CHỦ NGHĨA DUY VẬT LỊCH SỬ (tiếp theo)** **-Giới thiệu các khái niệm** II. Giai cấp và dân tộc *1. Vấn đề giai cấp và đấu tranh giai cấp* *2. Dân tộc* *3. Mối quan hệ giai cấp - dân tộc - nhân loại* III. Nhà nước và cách mạng xã hội *1. Nhà nước*	G1.4 G2.1 G.2.2 G3.1 G3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình. - Đọc trước phần IV chương 3.	A1.1, A1.2, A1.3, A3.1
14/3 tiết	**Chương 3** **CHỦ NGHĨA DUY VẬT LỊCH SỬ (tiếp theo)** IV. Ý thức xã hội *1. Khái niệm tồn tại xã hội và các yếu tố cơ bản của tồn tại xã hội* *2. Ý thức xã hội và kết cấu của ý thức xã hội*	G1.4 G2.1 G.2.2 G3.1 G3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng **Hoạt động học**: - Nghe giảng, phát biểu, làm việc nhóm, thuyết trình. - Đọc trước phần V chương 3.	A1.1, A1.2, A1.3, A3.1
15/3 tiết	**Chương 3** **CHỦ NGHĨA DUY VẬT LỊCH SỬ (tiếp theo)** V. Triết học về con người *1. Khái niệm con người và bản chất con người* *- Giới thiệu mục 2.3.4* *- Ôn tập thi cuối kỳ*	G1.4 G2.1 G.2.2 G3.1 G3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng - Ôn tập thi cuối kỳ **Hoạt động học**: - Thuyết trình, thảo luận nhóm - Nghe giảng, ôn tập	A1.1, A1.2, A1.3, A3.1

(1): Thông tin về tuần/buổi học.

(2): Liệt kê nội dung giảng dạy theo chương, mục

(3): Liệt kê CĐR liên quan của môn học (ghi ký hiệu Gx.x),

(4): Liệt kê các hoạt động dạy và học (ở lớp, ở nhà), bao gồm đọc trước tài liệu

(nếu có yêu cầu)

(5): Liệt kê các bài đánh giá liên quan (ghi ký hiệu Ax.x)

Thực hành

Tuần/Buổi học (1)	Nội dung (2)	CĐR môn học (3)	Hoạt động dạy và học (4)	Bài đánh giá (5)
…	Bài thực hành 1: …	Gx.x …	Dạy: … Học ở lớp: … Học ở nhà: …	Ax.x …

(1): Thông tin về tuần/buổi học. (2): Liệt kê nội dung thực hành theo bài thực hành

(3): Liệt kê CĐR liên quan của môn học (ghi ký hiệu Gx.x),

(4): Liệt kê các hoạt động dạy và học (ở lớp, ở nhà), bao gồm đọc trước tài liệu (nếu có yêu cầu)

(5): Liệt kê các bài đánh giá liên quan (ghi ký hiệu Ax.x)

8. Quy định của môn học

(Các quy định của môn học (nếu có), thí dụ: sinh viên không nộp bài tập và các báo cáo đúng hạn, được coi như không nộp bài; sinh viên vắng 2 buổi thực hành trở lên, không được phép dự thi cuối kỳ ...)

- Quy định về Bài thuyết trình nhóm:
  - Thành lập nhóm: Số lượng sinh viên tùy vào sĩ số lớp, do giảng viên quy định. Hạn chót đăng ký đề tài nhóm quản lý trên forum là buổi 2 hoặc trực tiếp nộp cho GV buổi 1.
  - Các nhóm thuyết trình theo thứ tự được phân công. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan khi thuyết trình.
  - Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV
- Quy định về giờ giấc, chuyên cần, kỷ luật trong khóa học: Lên lớp đúng giờ, dự tối thiểu 80% thời gian học trên lớp (chỉ được phép vắng mặt tối đa 20% số tiết học). Nếu vắng quá số tiết quy định thì sẽ bị điểm 0 chuyên cần.

9. Phụ trách môn học

- Khoa/Bộ môn: Bộ môn Lý luận và Khoa học chính trị, Khoa Chính trị - Hành chính
- Địa chỉ và email liên hệ: daotao.spas@vnuhcm.edu.vn

Tp. Hồ Chí Minh, ngày 01 tháng 10 năm 2023

KT. Trưởng Bộ môn Phó trưởng Bộ môn	KT. TRƯỞNG KHOA PHÓ TRƯỞNG KHOA
TS. Mạch Thị Khánh Trinh	TS. Nguyễn Đình Quốc Cường

ĐẠI HỌC QUỐC GIA TP.HCM
KHOA CHÍNH TRỊ - HÀNH CHÍNH

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

ĐỀ CƯƠNG CHI TIẾT MÔN HỌC

(Dành cho Trường Đại học Quốc tế, ĐHQG-HCM)

1. Thông tin tổng quát

- Tên môn học:
  - Tiếng Việt: **Kinh tế chính trị Mác - Lênin**
  - Tiếng Anh: Political economics of Marxism and Leninism
- Mã số môn học: PE016IU
- Thuộc khối kiến thức/kỹ năng:

☒ Kiến thức cơ bản/giáo dục đại cương ☐ Kiến thức cơ sở ngành
☐ Kiến thức chuyên ngành ☐ Kiến thức khác
☐ Môn học chuyên về kỹ năng chung ☐ Môn học đồ án/luận văn tốt nghiệp

- Số tín chỉ: 02
  - Lý thuyết: *21 (trên lớp)*
  - Thực hành (thuyết trình): *09 (trên lớp)*, *60 (về nhà)*
- Môn học tiên quyết:
- Môn học trước: Triết học Mác – Lênin
- Môn học song hành:

2. Mô tả môn học

Môn học này cung cấp cho sinh viên những phân tích của Các Mác về phương thức sản xuất tư bản chủ nghĩa và chỉ ra giới hạn phát triển của phương thức sản xuất này. V.I.Lênin bổ sung học thuyết kinh tế chính trị của Mác trong tình hình mới – giai đoạn chủ nghĩa tư bản độc quyền thống trị. Dựa vào nội dung cơ bản của kinh tế chính trị Mác – Lênin, sinh viên được tìm hiểu về mô hình kinh tế tổng quát của Việt Nam trong thời kỳ quá độ - Kinh tế thị trường định hướng xã hội chủ nghĩa. Bên cạnh đó, môn học này cũng cũng cung cấp cho sinh viên về tính tất yếu phải công nghiệp hóa, hiện đại hóa và hội nhập kinh tế quốc tế trong bối cảnh CMCN lần thứ 4 và toàn cầu hóa diễn ra mạnh mẽ.

3. Tài liệu học tập

3.1. Giáo trình

[1] Bộ Giáo dục và Đào tạo (2021), *Giáo trình Kinh tế chính trị Mác – Lênin,* (dùng cho khối không chuyên ngành lý luận chính trị) Nxb. Chính trị quốc gia, Hà Nội.

[2] Bộ Giáo dục và Đào tạo (2012), *Giáo trình Những Nguyên lý cơ bản của chủ nghĩa Mác – Lênin,* Nxb. Chính trị quốc gia, Hà Nội.

3.2.Tài liệu khác

[3] Các Mác, *Tư bản*, NXB Chính trị quốc gia Sự thật, Hà Nội, 2018

[4] Klaus Schwab (2018), *Cách mạng công nghiệp lần thứ tư,* NXB Thế giới.

[5] V.I.Lênin, Toàn tập – tập 27, NXB Chính trị Quốc gia Sự thật, 2005

3.3. Phần mềm: N/A

4. Mục tiêu môn học

(các mục tiêu tổng quát của môn học, thể hiện sự liên quan với các chuẩn đầu ra (X.x.x) của CTĐT và trình độ năng lực (TĐNL)được phân bổ cho môn học)

Mục tiêu (1)	Mô tả mục tiêu (2)	CĐR của môn học tương ứng CTĐT (3)	TĐNL tương ứng CTĐT (4)
G1	***4.1 Về kiến thức*** Sinh viên hiểu được sự vận động và phát triển của phương thức sản xuất tư bản chủ nghĩa và giới hạn của nó theo phân tích của Mác – Lênin. Sinh viên cũng được hiểu rõ về mô hình kinh tế của Việt Nam thời kỳ quá độ lên chủ nghĩa xã hội đó là kinh tế thị trường định hướng xã hội chủ nghĩa. Ngoài ra, sinh viên cũng hiểu rõ về công nghiệp hóa, hiện đại hóa và hội nhập kinh tế quốc tế của Việt Nam.		3.5
G2	***4.2. Về kỹ năng*** Sinh viên vận dụng những kiến thức đã học có thể nhận định, phân tích và đánh giá các vấn đề kinh tế chính trị trong nước và quốc tế. Vận dụng kiến thức kinh tế chính trị Mác – Lênin để		3.0

	đánh giá chủ nghĩa tư bản đương đại cũng như phân tích, đánh giá được mô hình kinh tế của Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội. Ngoài ra, sinh viên còn vận dụng kiến thức kinh tế chính trị để phân tích quá trình công nghiệp hóa, hiện đại hóa và hội nhập kinh tế quốc tế của Việt Nam.		
G3	***4.3. Về thái độ/năng lực tự chủ và trách nhiệm*** Vận dụng kiến thức kinh tế chính trị Mác – Lênin để có thái độ tích cực trong việc góp phần vào xây dựng và bảo vệ con đường chủ nghĩa xã hội của Việt Nam. Đấu tranh bác bỏ những luận điệu xuyên tạc, chống phá Chủ nghĩa Mác – Lênin và sự lãnh đạo của Đảng Cộng sản Việt Nam.		4.0

(1): Ký hiệu mục tiêu của môn học. (2): Mô tả các mục tiêu bao gồm các động từ chủ động, các chủ đề CĐR (X.x.x) và bối cảnh áp dụng tổng quát

(3), (4): Ký hiệu CĐR của CTĐT và TĐNL tương ứng được phân bổ cho môn học.

5. Chuẩn đầu ra môn học

CĐR (1)	**Mô tả CĐR (2)**	**Mức độ giảng dạy (3)**
G1.1	G1.1.1. Hiểu rõ lịch sử của kinh tế chính trị và kinh tế chính trị Mác – Lênin.	I, T
	G1.1.2 Hiểu rõ về mục tiêu, phương pháp và chức năng của KTCT Mác - Lênin	I.T
G1.2	G1.2.1. Hiểu rõ hai thuộc tính của hàng hóa và cấu trúc của giá trị hàng hóa	I.T.U
	G1.2.2. Hiểu về mặt chất và mặt lượng của giá trị hàng hóa và các nhân tố ảnh hưởng đến mặt lượng giá trị hàng hóa	I, T
	G1.2.3. Hiểu rõ mối quan hệ giữa giá trị hàng hóa và tiền tệ	I, T, U
	G1.2.4. Hiểu về thị trường và các quy luật cơ bản của kinh tế thị trường	I, T, U

G1.3	G1.3.1. Hiểu rõ được công thức chung của tư bản và mâu thuẫn của nó	I, T
	G1.3.2. Hiểu rõ được nguồn gốc của giá trị thặng dư TBCN	I, T
	G1.3.3. Hiểu rõ hàng hóa sức lao động và tính chất đặc biệt của nó	I, T
	G1.3.4. Hiểu được bản chất và các hình thức của tiền công	I, T, U
	G1.3.5. Hiểu được các phương pháp sản xuất giá trị thặng dư TBCN	I, T
	G1.3.6. Hiểu rõ ý nghĩa của tuần hoàn và chu chuyển tư bản	I, T
	G1.3.7. Hiểu được mục dích của tích lũy tư bản	I, T, U
	G1.3.8. Hiểu rõ các hình thức biểu hiện của giá trị thặng dư TBCN là mối quan hệ của chúng	I, T
G1.4	G1.4.1. Hiểu rõ hai giai đoạn phát triển của CNTB	I, T
	G1.4.2. Hiểu được nguyên nhân hình thành CNTB độc quyền	I, T
	G1.4.3. Hiểu được 5 đặc điểm của CNTB độc quyền theo phân tích của V.I. Lênin	I, T
	G1.4.4. Hiểu được những nguyên nhân hình thành và đặc điểm của chủ nghĩa tư bản độc quyền nhà nước.	I, T
G1.5	G1.5.1. Hiểu rõ về mô hình kinh tế thị trường định hướng XHCN và các đặc trưng của nó	I, T
	G1.5.2. Hiểu rõ về vai trò của thể chế kinh tế thị trường định hướng XHCN và tại sao cần phải hoàn thiện nó	I, T
	G1.5.3. Hiểu rõ vai trò của lợi ích kinh tế và các quan hệ lợi ích kinh tế trong nền kinh tế thị trường.	I, T
G1.6	G1.6.1. Hiểu rõ lý do tại sao một quốc gia cần phải tiến hành CNH và các quốc gia CNH thành công tiêu biểu	I, T
	G1.6.2. Hiểu rõ lịch sử và đặc trưng của các cuộc CMCN và mối liên hệ giữa CMCN với CNH	I, T,U
	G1.6.3. Hiểu rõ quá trình CNH, HĐH của Việt Nam	I, T
	G1.6.4. Hiểu được tính tất yếu của Việt Nam phải hội nhập kinh tế quốc tế trong bối cảnh toàn cầu hóa	I, T
	G2.1. Vận dụng phương pháp trừu tượng hóa khoa học để phân tích các vấn đề kinh tế chính trị	U
	G2.2. Vận dụng kiến thức kinh tế chính trị Mác -	

G2	Lênin để đánh giá chủ nghĩa tư bản hiện nay và sự lựa chọn con đường tiến lên CNXH của Việt Nam	U
	G2.3.Vận dụng kiến thức về kinh tế thị trường định hướng XHCN để hiểu rõ con đường đi lên CNXH của Việt Nam từ đó đấu tranh chống lại các thế lực chống phá chủ nghĩa Mác - Lênin	U
	G2.4. Vận dụng kiến thức về CNH, HĐH và hội nhập kinh tế quốc tế để phân tích chiến lược phát triển của Việt Nam trong bối cảnh CMCN 4.0 và toàn cầu hóa diễn ra ngày càng sâu rộng	U
G3	G3.1.Vận dụng kiến thức kinh tế chính trị Mác - Lênin, đóng góp vào công cuộc xây dựng chủ nghĩa xã hội	U
	G3.2.Vận dụng kiến thức kinh tế chính trị Mác – Lênin đấu tranh chống lại các luận điệu xuyên tạc chủ nghĩa Mác – Lênin và con đường đi lên CNXH của Việt Nam	U

(1): Ký hiệu CĐR của môn học

(2): Mô tả CĐR, bao gồm các động từ chủ động, các chủ đề CĐR ở cấp độ 4 (X.x.x.x) và bối cảnh áp dụng cụ thể.

(3): I (Introduce): giới thiệu; T (Teach): dạy; U (Utilize): sử dụng

6. Đánh giá môn học

(các thành phần, các bài đánh giá, các tiêu chí đánh giá, chuẩn đánh giá, và tỷ lệ đánh giá, thể hiện sự tương quan với các CĐR của môn học)

Thành phần đánh giá (1)	Bài đánh giá (2)	CĐR môn học (3)	Tỷ lệ % (4)
A1. Đánh giá quá trình	- Chuyên cần (A1.1) - Tham gia học tập trên lớp tích cực, hăng hái phát biểu (A1.2) - Thuyết trình nhóm (A1.3)	G1.1- G1.6; G2.1 - G2.4; G3.1- G3.2	30%
A2. Đánh giá giữa kỳ	Kiểm tra tự luận: 60 phút (A2.1)	G1.1, G1.2, G1.3	20%
A3. Đánh giá cuối kỳ	Tự luận sinh viên được sử dụng tài liệu khi làm bài thi: 60 phút (A3.1)	G1.1 - G1.6; G2.1-G2.4	50%

(1): Các thành phần đánh giá của môn học. (2): Các bài đánh giá

(3): Các CĐR được đánh giá. (4): Tiêu chí đánh giá. (5): Chuẩn đánh giá

(6): Tỷ lệ điểm của các bài đánh giá trong tổng điểm môn học

7. Kế hoạch giảng dạy chi tiết

Tuần/Buổi học (1)	Nội dung (2)	CĐR môn học (3)	Hoạt động dạy và học (4)	Bài đánh giá (5)
1/4 tiết	**Giới thiệu về môn học** **Chương 1** **ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU VÀ CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊ MÁC – LÊNIN** I. Khái quát về sự hình thành và phát triển của kinh tế chính trị Mác – Lênin. II. Đối tượng, mục đích và phương pháp nghiên cứu của kinh tế chính trị Mác – Lênin III. Chức năng của kinh tế chính trị Mác – Lênin **Chương 2** **HÀNG HÓA, THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THỂ THAM GIA THỊ TRƯỜNG** **I. Lý luận của C. Mác về sản xuất hàng hóa và hàng hóa** 1. Sản xuất hàng hóa 2. Hàng hóa *- Khái niệm và thuộc tính của hàng hóa.* *- Tính hai mặt của lao động sản xuất hàng hóa.* *- Lượng giá trị và các nhân tố ảnh hưởng đến lượng giá trị của hàng hóa.*	G.1.1 G.1.2	**Hoạt động dạy**: - Giới thiệu về môn học, cơ cấu điểm, cách thức giảng dạy và học tập môn Kinh tế chính trị Mác – Lênin - Giới thiệu nội dung đề tài thuyết trình nhóm GHW) - Trình chiếu, thuyết giảng chương 1,2 và giải đáp thắc mắc. **Hoạt động học**: - Chia nhóm - Giới thiệu nhóm học tập - Nghe giảng, phát biểu, nêu thắc mắc - Đọc trước chương 2 và chương 3	A1.1 A1.2 A2.1 A3.1
	Chương 2 **HÀNG HÓA, THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THỂ THAM GIA THỊ TRƯỜNG (tiếp theo)**		**Hoạt động dạy**: - Trình chiếu, thuyết giảng, giải đáp thắc	A1.1 A1.2

2/4 tiết	3. Tiền tệ 4. Dịch vụ và quan hệ trao đổi trong trường hợp một số yếu tố khác hàng hóa thông thường ở điều kiện ngày nay **II. Thị trường và nền kinh tế thị trường.** 1. Khái niệm, phân loại và vai trò của thị trường. 2. Nền kinh tế thị trường và một số quy luật chủ yếu của nền kinh tế thị trường *- Nền kinh tế thị trường.* *- Một số quy luật kinh tế chủ yếu của nền kinh tế thị trường.* **III. Vai trò của một số chủ thể tham gia thị trường.** 1. Người sản xuất 2. Người tiêu dùng 3. Các chủ thể trung gian trong thị trường. 4. Nhà nước.	G.1.2 G.2.1	mắc - Tổng kết nội dung thuyết trình nhóm **Hoạt động học**: - Nghe giảng, thảo luận, phát biểu, nêu thắc mắc. - Thuyết trình nhóm GHW - Đọc trước chương 3.	A1.3 A2.1 A3.1
3/4 tiết	**Chương 3** **GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG** **I. Lý luận của Các Mác về giá trị thặng dư** 1. Nguồn gốc của giá trị thặng dư. *- Công thức chung của tư bản* *- Hàng hóa sức lao động* *- Sự sản xuất giá trị thặng dư* *- Tư bản bất biến và tư bản khả biến* *- Tiền công* *- Tuần hoàn và chu chuyển tư bản* 2. Bản chất của giá trị thặng dư 3. Các phương pháp sản xuất giá trị thặng dư	G.1.3 G.2.2 G.3.1 G.3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng, giải đáp thắc mắc - Tổng kết nội dung thuyết trình nhóm **Hoạt động học**: - Nghe giảng, thảo luận, phát biểu, nêu thắc mắc. - Thuyết trình nhóm GHW	A1.1 A1.2 A1.3 A2.1 A3.1

			- Đọc trước chương 4.	
4/4 tiết	**Chương 3** **GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG (tiếp theo)** **II. Tích lũy tư bản** 1. Bản chất của tích lũy tư bản. 2. Những nhân tố ảnh hưởng đến quy mô tích lũy. 3. Một số hệ quả của tích lũy tư bản. **III. Các hình thức biểu hiện của giá trị thặng dư trong nền kinh tế thị trường.** 1. Lợi nhuận 2. Lợi tức. 3. Địa tô TBCN	G.1.3 G.2.2 G.3.1 G.3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng, giải đáp thắc mắc - Tổng kết nội dung thuyết trình nhóm **Hoạt động học**: - Nghe giảng, thảo luận, phát biểu, nêu thắc mắc. - Thuyết trình nhóm GHW - Đọc trước chương 4.	A1.1 A1.2 A1.3 A2.1 A3.1
5/4 tiết	**Chương 4** **CẠNH TRANH VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG (tiếp theo)** 1. Lý luận của V.I. Lê nin về đặc điểm kinh tế của độc quyền (tt). *- Xuất khẩu tư bản trở thành phổ biến* *- Cạnh tranh để phân chia thị trường thế giới là tất yếu giữa các tập đoàn độc quyền.* *- Lôi kéo, thúc đẩy các chính phủ vào việc phân định khu vực lãnh thổ ảnh hưởng là cách thức để bảo vệ lợi ích độc quyền.* 2. Lý luận của V.I. Lênin về đặc điểm kinh tế của độc quyền nhà nước trong CNTB	G.1.4 G.2.2 G.3.1 G.3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng, giải đáp thắc mắc - Tổng kết nội dung thuyết trình nhóm **Hoạt động học**: - Nghe giảng, thảo luận, phát biểu, nêu thắc mắc. - Thuyết trình nhóm GHW - Đọc trước chương 5.	A1.1 A1.2 A1.3 A3.1

	- Sự kết hợp nhân sự giữa tổ chức độc quyền và nhà nước. - Sự hình thành, phát triển sở hữu nhà nước. - Độc quyền nhà nước trở thành công cụ để nhà nước điều tiết nền kinh tế. **III. Biểu hiện mới của độc quyền, độc quyền nhà nước trong điều kiện ngày nay; vai trò lịch sử của CNTB.** 1. Biểu hiện mới của độc quyền 2. Biểu hiện mới của độc quyền nhà nước dưới CNTB 3. Vai trò lịch sử của CNTB			
6/4 tiết	**Chương 5** **KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM** **I. Kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam** 1. Khái niệm về kinh tế thị trường định hướng XHCN ở Việt Nam. 2. Tính tất yếu khách quan của việc phát triển kinh tế thị trường định hướng XHCN ở Việt Nam. 3. Đặc trưng của kinh tế thị trường định hướng XHCN ở Việt Nam. **II. Hoàn thiện thể chế kinh tế thị trường định hướng XHCN ở Việt Nam** 1. Sự cần thiết phải hoàn thiện thể chế kinh tế thị trường định hướng XHCN ở Việt Nam. 2. Nội dung hoàn thiện thể chế kinh tế thị trường định hướng XHCN ở	G.1.5 G.2.3 G.3.1 G.3.2	**Hoạt động dạy:** - Trình chiếu, thuyết giảng, giải đáp thắc mắc - Tổng kết nội dung thuyết trình nhóm **Hoạt động học:** - Nghe giảng, thảo luận, phát biểu, nêu thắc mắc. - Thuyết trình nhóm GHW - Đọc trước chương 6.	A1.1 A1.2 A1.3 A3.1

	Việt Nam. **III. Các quan hệ lợi ích kinh tế ở Việt Nam.** 1. Lợi ích kinh tế và quan hệ lợi ích kinh tế. - *Lợi ích kinh tế*			
7/4 tiết	**Chương 5** **KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM (tiếp theo)** 1. Lợi ích kinh tế và quan hệ lợi ích kinh tế (tt). - *Quan hệ lợi ích kinh tế.* 2. Vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích. - Bảo vệ lợi ích hợp pháp, tạo môi trường thuận lợi cho hoạt động tìm kiếm lợi ích của các chủ thể kinh tế. - Điều hòa lợi ích giữa cá nhân – doanh nghiệp – xã hội. - Kiểm soát, ngăn ngừa các quan hệ lợi ích có ảnh hưởng tiêu cực đối với sự phát triển của xã hội. **Chương 6** **CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA VÀ HỘI NHẬP KINH TẾ QUỐC TẾ CỦA VIỆT NAM** **I. Công nghiệp hóa, hiện đại hóa của Việt Nam.** 1. Khái quát về cách mạng công nghiệp và công nghiệp hóa. - Khái quát về cách mạng công nghiệp - Công nghiệp hóa và các mô hình công nghiệp hóa trên thế giới	G.1.5 G.1.6 G.2.3 G.2.4 G.3.1 G.3.2	**Hoạt động dạy**: - Trình chiếu, thuyết giảng, giải đáp thắc mắc - Tổng kết nội dung thuyết trình nhóm **Hoạt động học**: - Nghe giảng, thảo luận, phát biểu, nêu thắc mắc. - Thuyết trình nhóm GHW - Đọc trước chương 6.	A1.1 A1.2 A1.3 A3.1
	Chương 6		**Hoạt động dạy**:	

8/2 tiết	**CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA VÀ HỘI NHẬP KINH TẾ QUỐC TẾ CỦA VIỆT NAM (tiếp theo)** 2. Tính tất yếu khách quan và nội dung công nghiệp hóa, hiện đại hóa ở Việt Nam. *- Tính tất yếu của công nghiệp hóa, hiện đại hóa ở Việt Nam.* *- Nội dung CNH, HĐH ở Việt Nam* **II. Hội nhập kinh tế quốc tế của Việt Nam** 1. Khái niệm và nội dung hội nhập kinh tế quốc tế. 2. Tác động của hội nhập kinh tế quốc tế đến quá trình phát triển của Việt Nam 3. Phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế trong phát triển của Việt Nam **Ôn tập thi cuối kì**	G.1.6 G.2.4 G.3.1 G.3.2	- Trình chiếu, thuyết giảng, tổng kết nội dung thuyết trình nhóm. - Giải đáp thắc mắc cho sinh viên - Công bố điểm quá trình. **Hoạt động học:** - Nghe giảng - Phát biểu, thảo luận - Nêu thắc mắc về môn học.	A1.1 A1.2 A1.3 A3.1

(1): Thông tin về tuần/buổi học. (2): Liệt kê nội dung giảng dạy theo chương, mục

(3): Liệt kê CĐR liên quan của môn học (ghi ký hiệu Gx.x),

(4): Liệt kê các hoạt động dạy và học (ở lớp, ở nhà), bao gồm đọc trước tài liệu (nếu có yêu cầu)

(5): Liệt kê các bài đánh giá liên quan (ghi ký hiệu Ax.x)

8. Quy định của môn học

- Quy định về Bài thuyết trình nhóm GHW:

+ Thành lập nhóm: 5 sinh viên/nhóm. Hạn chót đăng ký đề tài nhóm Quản lý trên forum là buổi 1 hoặc trực tiếp nộp cho GV.

+ Tuần 2 (buổi thứ 2) thuyết trình theo thứ tự. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến GHW khi đi thuyết trình.

+ Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV

- Quy định về giờ giấc, chuyên cần, kỷ luật trong khóa học: Lên lớp đúng giờ, dự tối thiểu 80% thời gian học trên lớp (chỉ được phép vắng mặt tối đa 20% số tiết học). Nếu vắng quá số tiết quy định sẽ bị cấm thi theo quy chế. Có đầy đủ điểm kiểm tra, điểm thi kết thúc học phần & nhiệt tình thảo luận, phát biểu xây dựng bài, nghiêm túc trong giờ học.

9. Phụ trách môn học

- Khoa/Bộ môn: Bộ môn Lý luận và Khoa học chính trị, Khoa Chính trị - Hành chính
- Email liên hệ: daotao.spas@vnuhcm.edu.vn.

TP. Hồ Chí Minh, ngày 01 tháng 10 năm 2023

KT. Trưởng Bộ môn	**KT. TRƯỞNG KHOA**
Phó trưởng Bộ môn	**PHÓ TRƯỞNG KHOA**
Lê Văn Thông	**TS. Nguyễn Đình Quốc Cường**

ĐẠI HỌC QUỐC GIA TP. HỒ CHÍ MINH
KHOA CHÍNH TRỊ - HÀNH CHÍNH

ĐỀ CƯƠNG CHI TIẾT MÔN HỌC
(dành cho trường Đại học Quốc Tế)

1. Thông tin tổng quát

Tên môn học:

Tiếng Việt	**Chủ nghĩa xã hội khoa học**
Tiếng Anh	**Scientific socialism**
- Mã số môn học:	PA21GEP03

Thuộc khối kiến thức/kỹ năng:

☒ Kiến thức cơ bản/giáo dục đại cương	☐ Kiến thức cơ sở ngành
☐ Kiến thức chuyên ngành	☐ Kiến thức khác
☐ Môn học chuyên về kỹ năng chung	☐ Môn học đồ án/luận văn tốt nghiệp

- Số tín chỉ:	2 (30 tiết)
Lý thuyết	30 tiết
Thực hành	
- Môn học tiên quyết:	
- Môn học trước:	Triết học Mác – Lênin
- Môn học song hành:	

2. Mô tả môn học

(Vị trí của môn học đối với chương trình đào tạo (CTĐT), những mục đích và nội dung chính yếu của môn học)

Môn học thuộc phần kiến thức giáo dục đại cương trong khối kiến thức cơ bản về lý luận chính trị.

Trang bị cho sinh viên những kiến thức cơ bản về chủ nghĩa xã hội khoa học: Đối tượng, phương pháp nghiên cứu, ý nghĩa của việc nghiên cứu chủ nghĩa xã hội khoa học; về sứ mệnh lịch sử của giai cấp công nhân; về chủ nghĩa xã hội và thời kỳ quá độ lên chủ nghĩa xã hội; về dân chủ xã hội chủ nghĩa và nhà nước xã hội chủ nghĩa; về cơ cấu xã hội - giai cấp và liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội; về vấn đề dân tộc và tôn giáo trong thời kỳ quá độ lên chủ nghĩa xã hội.

Môn học có mối quan hệ trực tiếp tới việc giáo dục lập trường, tư tưởng cho sinh viên, cũng như cung cấp kiến thức chuyên sâu cho sinh viên trong cách nhìn nhận các vấn đề chính trị xã hội.

3. Tài liệu học tập

(Các giáo trình, tài liệu tham khảo, các phần mềm, không quá 5 cuốn)

Giáo trình:

- Bộ Giáo dục và Đào tạo (2021), *Giáo trình Chủ nghĩa xã hội khoa học,* (dùng cho

khối không chuyên ngành lý luận chính trị) Nxb. Chính trị quốc gia, Hà Nội.
- Bộ Giáo dục và Đào tạo (2012), *Giáo trình Những Nguyên lý cơ bản của chủ nghĩa Mác – Lênin,* Nxb. Chính trị quốc gia, Hà Nội.
- Hội đồng Trung ương (2008), *Giáo trình Chủ nghĩa xã hội khoa học*, Nxb. Chính trị quốc gia, Hà Nội.

Tài liệu khác:

[1] Tên tác giả (năm xuất bản), *Tên giáo trình*. Nơi xuất bản: Tên nhà xuất bản

Phần mềm:

[..] Tên hãng phần mềm (năm phát hành/phiên bản). *Tên phần mềm…*

4. Mục tiêu môn học

(Các mục tiêu tổng quát của môn học, thể hiện sự liên quan với các chuẩn đầu ra (X.x.x) của CTĐT và trình độ năng lực (TĐNL) được phân bổ cho môn học)

Mục tiêu (1)	Mô tả mục tiêu (2)	CĐR của môn học tương ứng CTĐT (3)
G1	***Về kiến thức*** - Sinh viên hiểu một cách có hệ thống những nội dung cơ bản của học phần chủ nghĩa xã hội khoa học. Cùng các môn lý luận chính trị và các môn học khác giúp sinh viên có nhận thức tổng hợp, toàn diện về chủ nghĩa Mác-Lênin, tư tưởng Hồ Chí Minh và con đường đi lên CNXH ở Việt Nam. - Sinh viên hiểu những tri thức khoa học để luận giải sự ra đời tất yếu của chủ nghĩa xã hội, những nhiệm vụ, giải pháp cần thực hiện trong quá trình xây dựng chủ nghĩa xã hội nói chung và ở Việt Nam nói riêng. - Sinh viên hiểu những căn cứ khoa học để chống lại những nhận thức sai lệch và sự chống phá của các thế lực thù địch.	
G2	***Về kỹ năng*** Sinh viên phân tích, đánh giá, giải quyết các vấn đề chính trị - xã hội nảy sinh trong thực tiễn. Và vận dụng quan điểm khoa học của chủ nghĩa Mác - Lênin để nhận diện được âm mưu diễn biến hòa bình của các thế lực phản động, thù địch.	
G3	***Về thái độ/năng lực tự chủ và trách nhiệm*** Sinh viên đánh giá được sự cần thiết của việc học tập các môn lý luận chính trị; có niềm tin vào mục tiêu, lý tưởng xã hội chủ nghĩa và con đường đi lên chủ nghĩa xã hội; tin tưởng vào sự thành công của công cuộc đổi mới do Đảng Cộng sản Việt Nam khởi xướng và lãnh đạo.	

(1): Ký hiệu mục tiêu của môn học. (2): Mô tả các mục tiêu bao gồm các động từ chủ động, các chủ đề CĐR (X.x.x) và bối cảnh áp dụng tổng quát

(3), (4): Ký hiệu CĐR của CTĐT và TĐNL tương ứng được phân bổ cho môn học.

5. Chuẩn đầu ra môn học

(Các mục cụ thể hay CĐR của môn học và mức độ giảng dạy I, T, U)

CĐR (1)	Mô tả CĐR (2)	Mức độ giảng dạy (I, T, U) (3)
G1.1	Sinh viên hiểu những kiến thức cơ bản, hệ thống về sự ra đời, các giai đoạn phát triển; đối tượng, phương pháp nghiên cứu và ý nghĩa của việc học tập, nghiên cứu chủ nghĩa xã hội khoa học. Trên cơ sở đó tạo điều kiện để sinh viên nghiên cứu các phạm trù tiếp theo của chủ nghĩa xã hội khoa học.	I, T
G1.2	Sinh viên hiểu những nội dung cơ bản của lý luận về sứ mệnh lịch sử toàn thế giới của giai cấp công nhân, biểu hiện và ý nghĩa của sứ mệnh đó trong bối cảnh hiện nay.	I, T
G1.3	Sinh viên hiểu những kiến thức cơ bản và hệ thống quan điểm của chủ nghĩa Mác - Lênin về hình thái kinh tế - xã hội cộng sản chủ nghĩa, về chủ nghĩa xã hội, thời kỳ quá độ lên chủ nghĩa xã hội và quá độ lên chủ nghĩa xã hội bỏ qua chế độ tư bản chủ nghĩa ở Việt Nam.	T, U
G1.4	Sinh viên hiểu đầy đủ và đúng bản chất của nền dân chủ xã hội chủ nghĩa và nhà nước xã hội chủ nghĩa, quan điểm của Đảng Cộng sản Việt Nam về việc xây dựng và hoàn thiện nền dân chủ và nhà nước xã hội chủ ở Việt Nam hiện nay.	T, U
G1.5	Sinh viên hiểu những kiến thức nền tảng về cơ cấu xã hội - giai cấp và liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội. Giúp sinh viên hiểu rõ vị trí, vai trò của những giai cấp, tầng lớp cơ bản trong quá trình xây dựng đất nước và nội dung của liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam.	T, U
G1.6	Sinh viên hiểu quan điểm cơ bản chủ nghĩa Mác-Lênin về vấn đề dân tộc, tôn giáo. Sinh viên nắm được những nội dung cơ bản của chính sách dân tộc, tôn giáo của Đảng và Nhà nước ta.	T, U
G1.7	Sinh viên hiểu những quan điểm cơ bản của chủ nghĩa Mác - Lênin, tư tưởng Hồ Chí Minh và Đảng Cộng sản Việt Nam về gia đình, xây dựng gia đình trong thời kỳ quá độ lên chủ nghĩa xã hội, xây dựng gia đình ở Việt Nam hiện nay.	T, U
G2.1	Sinh viên phân tích lý luận – thực tiễn về các vấn đề đặt ra trong cuộc sống một cách đúng đắn và nhận diện những biến đổi xã hội ở nước ta	U

CĐR (1)	Mô tả CĐR (2)	Mức độ giảng dạy (I, T, U) (3)
	trong thời kỳ quá độ lên chủ nghĩa xã hội.	
G2.2	Sinh viên vận dụng những nội dung trong bài học để phân tích, giải thích những vấn đề trong thực tiễn một cách khách quan, có cơ sở khoa học.	U
G2.3	Sinh viên vận dụng kiến thức môn học để làm việc nhóm, quản lý nhóm	U
G3.1	Xây dựng và củng cố niềm tin vào lý tưởng cộng sản chủ nghĩa, vào con đường đi lên chủ nghĩa xã hội, góp phần xây dựng thành công chủ nghĩa xã hội ở Việt Nam.	T, U
G3.2	Có ý thức chính trị - xã hội, thái độ kiên định về lập trường, tư tưởng, có tinh thần đấu tranh bảo vệ lẽ phải, bảo vệ những quan điểm, chủ trương, chính sách đúng đắn của Đảng và Nhà nước; chống lại biểu hiện thờ ơ về chính trị và những quan điểm sai trái, thù địch cũng như những biểu hiện tiêu cực trong đời sống xã hội.	U
G3.3	Có năng lực dạy học, tự nghiên cứu các vấn đề liên quan đến chủ nghĩa Mác- Lênin, tư tưởng Hồ Chí Minh, đường lối, sách lược của Đảng, Nhà nước.	U

(1): Ký hiệu CĐR của môn học

(2): Mô tả CĐR, bao gồm các động từ chủ động, các chủ đề CĐR ở cấp độ 4 (X.x.x.x) và bối cảnh áp dụng cụ thể.

(3): I (Introduce): giới thiệu; T (Teach): dạy; U (Utilize): sử dụng

6.Đánh giá môn học

(Các thành phần, các bài đánh giá, các tiêu chí đánh giá, chuẩn đánh giá, và tỷ lệ đánh giá, thể hiện sự tương quan với các CĐR của môn học)

Thành phần đánh giá (1)	Bài đánh giá (2)	CĐR môn học (3)	Tỷ lệ % (6)
A1. Đánh giá quá trình	A1.1. Chuyên cần A1.2. Thuyết trình nhóm, bài tập lớn, thu hoạch…	G1.1 - G1.7, G2.1 - G2.3, G3.1- G3.3	30%
A2. Đánh giá giữa kỳ (Quiz)	A2.1. Trắc nghiệm (đề đóng) hoặc tự luận (được tham khảo tài liệu) thời gian làm bài 45 phút	G1.1 - G1.3, G2.1 - G2.3, G3.1- G3.3	20%
A3. Đánh giá cuối kỳ (FEX)	A3.1. Thi đề chung. Đề thi bao quát toàn bộ nội dung môn học bằng hình thức tự luận (đề mở). Thời gian 60 phút.	G1.1 - G1.7, G2.1 - G2.3, G3.1- G3.3	50%

(1): các thành phần đánh giá của môn học. (2): các bài đánh giá
(3): các CĐR được đánh giá. (4): tiêu chí đánh giá. (5): chuẩn đánh giá
(6): Tỷ lệ điểm của các bài đánh giá trong tổng điểm môn học

6. Kế hoạch giảng dạy chi tiết

Tuần/Buổi học (1)	Nội dung (2)	Hoạt động dạy và học (3)	CĐRMH (4)
1/ 2 tiết	**Giới thiệu về môn học** **Chương 1: NHẬP MÔN CHỦ NGHĨA XÃ HỘI KHOA HỌC** 1. SỰ RA ĐỜI CỦA CHỦ NGHĨA XÃ HỘI KHOA HỌC *11.. Hoàn cảnh lịch sử sự ra đời của chủ nghĩa xã hội khoa học* *1.2. Vai trò của C. Mác và Ăngghen*	**Dạy**: - Thông báo quy định giảng dạy, học tập. - Công bố quy định kiểm tra, đánh giá môn học - Giới thiệu nội dung môn học - Giới thiệu nội dung đề tài thuyết trình nhóm, chia nhóm **Học ngoài lớp**: - Đọc trước tài liệu chương 1. **Dạy:** thuyết giảng **Học ở lớp**: Thảo luận và phát biểu trên lớp.	G1.1 G2.1 G2.2 G3.1 G3.1 G3.3
2/2 tiết	**Chương 1: NHẬP MÔN CHỦ NGHĨA XÃ HỘI KHOA HỌC** 2. CÁC GIAI ĐOẠN PHÁT TRIỂN CƠ BẢN CỦA CHỦ NGHĨA XÃ HỘI KHOA HỌC *2.1. C.Mác và Ph.Ăngghen phát triển chủ nghĩa xã hội khoa học* *2.2. V.I.Lênin vận dụng và phát triển chủ nghĩa xã hội khoa học trong điều kiện mới* *2.3. Sự vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học từ sau khi Lênin qua đời đến nay* 3. ĐỐI TƯỢNG, PHƯƠNG PHÁP VÀ Ý NGHĨA CỦA VIỆC NGHIÊN CỨU CHỦ NGHĨA XÃ HỘI KHOA HỌC *3.1. Đối tượng nghiên cứu của chủ nghĩa xã hội khoa học*	**Dạy:** thuyết giảng phần 1; 2.1. Hướng dẫn tự đọc phần còn lại. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: - Phác thảo nội dung thuyết trình nhóm GHW - Đọc trước tài liệu chương 2.	G1.1 G2.1 G2.2 G3.1 G3.1 G3.3

	3.2. Phương pháp nghiên cứu của chủ nghĩa xã hội khoa học *3.3. Ý nghĩa của viêc nghiên cứu chủ nghĩa xã hội khoa học*		
3/ 2 tiết	**Chương 2** **SỨ MỆNH LỊCH SỬ CỦA GIAI CẤP CÔNG NHÂN** **1. Quan điểm cơ bản của chủ nghĩa Mác - Lênin về giai cấp công nhân và sứ mệnh lịch sử thế giới của giai cấp công nhân** *1.1. Khái niệm và đặc điểm của giai cấp công nhân* *1.2. Nội dung và đặc điểm sứ mệnh lịch sử của giai cấp công nhân* *1.3. Những điều kiện quy định sứ mệnh lịch sử của giai cấp công nhân.* **2. Giai cấp công nhân và việc thực hiện sứ mệnh lịch sử của giai cấp công nhân hiện nay** *2.1. Giai cấp công nhân hiện nay* *2.2. Thực hiện sứ mệnh lịch sử của giai cấp công nhân trên thế giới hiện nay*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: - Đọc trước tài liệu mục 3, chương 2	G1.2 G2.1 G2.2 G3.1 G3.1 G3.3
4/ 2 tiết	**Chương 2: SỨ MỆNH LỊCH SỬ CỦA GIAI CẤP CÔNG NHÂN (tiếp theo)** 3. SỨ MỆNH LỊCH SỬ CỦA GIAI CẤP CÔNG NHÂN VIỆT NAM *3.1. Đặc điểm của giai cấp công nhân Việt Nam* *3.2. Nội dung sứ mệnh lịch sử của giai cấp công nhân Việt Nam hiện nay* *3.3. Phương hướng và một số giải pháp chủ yếu để xây dựng giai cấp công nhân Việt Nam hiện nay*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: - Đọc trước tài liệu chương 3	G1.2 G2.1 G2.2 G3.1 G3.1 G3.3
5/ 2 tiết	**Chương 3: CHỦ NGHĨA XÃ HỘI VÀ THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI** 1. CHỦ NGHĨA XÃ HỘI *1.1. Chủ nghĩa xã hội, giai đoạn đầu của hình thái kinh tế - xã hội công sản chủ*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**:	G1.3 G2.1 G2.2 G3.1 G3.1 G3.3

	nghĩa *1.2. Điều kiện ra đời chủ nghĩa xã hội* *Những đặt trưng cơ bản của chủ nghĩa xã hội* 2.THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI *2.1. Tính tất yếu khách quan của thời kỳ quá độ lên chủ nghĩa xã hội* *2.2. Đặc điểm của thời kỳ quá độ lên chủ nghĩa xã hội*	- Đọc trước tài liệu mục 3, chương 3	
6/ 2 tiết	**Chương 3: CHỦ NGHĨA XÃ HỘI VÀ THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI** **(tiếp theo)** 3.QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM *3.1. Quá độ lên chủ nghĩa xã hội bỏ qua chế độ tư bản chủ nghĩa* *3.2. Những đặc trưng cơ bản của chủ nghĩa xã hội và phương hướng xây dựng chủ nghĩa xã hội ở Việt Nam hiện nay*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: - ôn tập, chuẩn bị kiểm tra giữa kỳ	G1.3 G2.1 G2.2 G3.1 G3.1 G3.3
7/ 2 tiết	*-Kiểm tra giữa kỳ* *-Hướng dẫn tự đọc các nội dung của chương 4.5.6*	**Dạy:** Tổ chức kiểm tra giữa kỳ, hướng dẫn tự học **Học ở lớp**: Làn bài thi **Học ngoài lớp**: - Đọc trước tài liệu chương 4	G1.1, G1.2, G1.3 G2.1, G2.2, G2.3 G3.1, G3.1, G3.3
8 /2 tiết	**Chương 4: DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA** 1.DÂN CHỦ VÀ DÂN CHỦ XÃ HỘI CHỦ NGHĨA *1.1. Dân chủ và sự ra đời, phát triển của dân chủ* *1.2. Dân chủ xã hội chủ nghĩa* 2. NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA *2.1. Sự ra đời, bản chất, chức năng của nhà nước xã hội chủ nghĩa* *2.2. Mối quan hệ giữa dân chủ xã hội chủ nghĩa và nhà nước xã hội chủ nghĩa*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: Đọc trước tài liệu mục 3, chương 4	G1.4 G2.1 G2.2 G3.1 G3.1 G3.3

9/ 2 tiết	**Chương 4: DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA (tiếp theo)** 3. DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC PHÁP QUYỀN XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM *3.1. Dân chủ xã hội chủ nghĩa ở Việt Nam* *3.2. Nhà nước pháp quyền xã hội chủ nghĩa ở Việt Nam* *3.3. Phát huy dân chủ xã hội chủ nghĩa, xây dựng nhà nước pháp quyền xã hội chủ nghĩa ở Việt Nam hiện nay*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: Đọc trước tài liệu chương 5	G1.4 G2.1 G2.2 G3.1 G3.1 G3.3
10/ 2 tiết	**Chương 5: CƠ CẤU XÃ HỘI - GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI** 1.CƠ CẤU XÃ HỘI GIAI CẤP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI *1.1. Khái niệm và vị trí của cơ cấu xã hội - giai cấp trong cơ cấu xã hội* *1.2. Sự biến đổi có tính quy luật của cơ cấu xã hội - giai cấp trong thời kỳ quá độ lên chủ nghĩa xã hội* 2.LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI *2.1. Tính tất yếu của liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội* *2.2. Nội dung của liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: Đọc trước tài liệu mục 3, chương 5	G1.5 G2.1 G2.2 G3.1 G3.1 G3.3
11/ 2 tiết	**Chương 5: CƠ CẤU XÃ HỘI - GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI (tiếp theo)** 3.CƠ CẤU XÃ HỘI - GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: Đọc trước tài liệu	G1.5 G2.1 G2.2 G3.1 G3.1 G3.3

	TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM *3.1. Cơ cấu xã hội - giai cấp trong thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam.* *3.2. Liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam.*	chương 6	
12/ 2 tiết	**Chương 6: VẤN ĐỀ DÂN TỘC VÀ TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI** 1. DÂN TỘC TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI *1.1. Chủ nghĩa Mác - Lênin về dân tộc* *1.2. Dân tộc và quan hệ dân tộc ở Việt Nam*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: Đọc trước tài liệu mục 2, 3 chương 6	G1.6 G2.1 G2.2 G3.1 G3.1 G3.3
13/ 2 tiết	**Chương 6: VẤN ĐỀ DÂN TỘC VÀ TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI (tiếp theo)** 2. TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI *2.1. Chủ nghĩa Mác - Lênin về tôn giáo.* *2.2. Tôn giáo ở Việt Nam và chính sách tôn giáo của Đảng, Nhà nước ta hiện nay* 3. QUAN HỆ DÂN TỘC VÀ TÔN GIÁO Ở VIỆT NAM *3.1. Đặc điểm quan hệ dân tộc và tôn giáo ở Việt Nam* *3.2. Định hướng giải quyết mối quan hệ dân tộc và tôn giáo ở Việt Nam hiện nay.*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: Đọc trước tài liệu chương 7	G1.6 G2.1 G2.2 G3.1 G3.1 G3.3
14/ 2 tiết	**Chương 7: VẤN ĐỀ GIA ĐÌNH TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI** 1. KHÁI NIỆM, VỊ TRÍ VÀ CHỨC NĂNG CỦA GIA ĐÌNH *1.1. Khái niệm gia đình* *1.2. Vị trí của gia đình trong xã hội* *1.3. Chức năng cơ bản của gia đình*	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: Đọc trước tài liệu mục 3, chương 7	G1.7 G2.1 G2.2 G3.1 G3.1 G3.3

	2. CƠ SỞ XÂY DỰNG GIA ĐÌNH TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI *2.1. Cơ sở kinh tế - xã hội* *2.2. Cơ sở chính trị - xã hội* *2.3. Cơ sở văn hóa*		
15/ 2 tiết	**Chương 7: VẤN ĐỀ GIA ĐÌNH TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI (tiếp theo)** 3. XÂY DỰNG GIA ĐÌNH VIỆT NAM TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI *3.1. Sự biến đổi gia đình Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội* *3.2. Phương hướng cơ bản xây dựng và phát triển gia đình Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội.* **- Ôn tập thi cuối kỳ**	**Dạy:** thuyết giảng, phát vấn, chấm phản biện. **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: Ôn tập thi cuối kỳ	G1.7 G2.1 G2.2 G3.1 G3.1 G3.3

(Các nội dung giảng dạy theo buổi học, thể hiện sự tương quan với các CĐR của môn học, các hoạt động dạy và học (ở lớp, ở nhà) và các bài đánh giá của môn học)

Lý thuyết

(1): Thông tin về tuần/buổi học. (2): Liệt kê nội dung giảng dạy theo chương, mục

(3): Liệt kê CĐR liên quan của môn học (ghi ký hiệu Gx.x),

(4): Liệt kê các hoạt động dạy và học (ở lớp, ở nhà), bao gồm đọc trước tài liệu (nếu có yêu cầu)

(5): Liệt kê các bài đánh giá liên quan (ghi ký hiệu Ax.x)

Thực hành

Tuần/Buổi học (1)	Nội dung (2)	CĐR môn học (3)	Hoạt động dạy và học (4)	Bài đánh giá (5)

(1): Thông tin về tuần/buổi học. (2): Liệt kê nội dung thực hành theo bài thực hành

(3): Liệt kê CĐR liên quan của môn học (ghi ký hiệu Gx.x),

(4): Liệt kê các hoạt động dạy và học (ở lớp, ở nhà), bao gồm đọc trước tài liệu (nếu có yêu cầu)

(5): Liệt kê các bài đánh giá liên quan (ghi ký hiệu Ax.x)

7. Quy định của môn học

- Quy định về Bài thuyết trình nhóm GHW:

+ Thành lập nhóm: Số lượng sinh viên tùy tình hình thực tế của lớp, giảng viên quy định. Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2 hoặc trực tiếp nộp cho GV buổi 1.

+ Các nhóm thuyết trình theo thứ tự, giảng viên quy định. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến GHW khi đi thuyết trình.

+ Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV

- Quy định về giờ giấc, chuyên cần, kỷ luật trong khóa học:

+ Lên lớp đúng giờ, dự tối thiểu 80% thời gian học trên lớp (chỉ được phép vắng mặt tối đa 20% số tiết học). Nếu vắng quá số tiết quy định sẽ bị cấm thi theo quy chế.

+ Có đầy đủ các phần điểm quá trình, điểm kiểm tra giữa kỳ điểm thi kết thúc học phần.

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Lý luận và khoa học chính trị và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn

8. Phụ trách môn học

- Khoa/Bộ môn: Bộ môn Lý luận và khoa học chính trị - Khoa Chính trị - Hành chính (ĐHQG TP.HCM)

- Địa chỉ và email liên hệ: Tầng 7, nhà Điều hành ĐHQG. Khu phố 1. Phường Linh Trung, TP. Thủ Đức. Đại chỉ mail: daotao.spas@vnuhcm.edu.vn

Tp. Hồ Chí Minh, ngày 01 tháng 10 năm 2023

KT. Trưởng Bộ môn Phó trưởng Bộ môn (phụ trách)	KT.TRƯỞNG KHOA PHÓ TRƯỞNG KHOA
TS. Mạch Thị Khánh Trinh	TS. Nguyễn Đình Quốc Cường

ĐẠI HỌC QUỐC GIA TP. HCM
KHOA CHÍNH TRỊ - HÀNH CHÍNH

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

ĐỀ CƯƠNG CHI TIẾT MÔN HỌC

(DÀNH CHO TRƯỜNG ĐẠI HỌC QUỐC TẾ, ĐHQG-HCM)

1. THÔNG TIN CHUNG (General information)

- Tên môn học:
  - Tiếng Việt: **Lịch sử Đảng Cộng sản Việt Nam**
  - Tiếng Anh: History of Vietnamese communist party
- Mã số môn học: PE018IU
- Thuộc khối kiến thức/kỹ năng:

☒ Kiến thức cơ bản/giáo dục đại cương
☐ Kiến thức chuyên ngành
☐ Môn học chuyên về kỹ năng chung
☐ Kiến thức cơ sở ngành
☐ Kiến thức khác
☐ Môn học đồ án/luận văn tốt nghiệp

- Số tín chỉ: 02
  - Lý thuyết: 20 tiết
  - Thực hành (thuyết trình): 10 tiết (trên lớp), 60 tiết (về nhà)
- Môn học tiên quyết: Không
- Môn học trước:
- Môn học song hành: Không

2. MÔ TẢ MÔN HỌC (Course description)

Môn học nằm trong khối kiến thức giáo dục đại cương thuộc mảng lý luận chính trị. Môn học với những kiến thức cơ bản, hệ thống về Lịch sử Đảng Cộng sản Việt Nam như: sự ra đời của Đảng Cộng sản Việt Nam, sự lãnh đạo của Đảng trong đấu tranh giành chính quyền, giải phóng dân tộc và xây dựng chủ nghĩa xã hội từ năm 1930 đến năm nay.

3. MỤC TIÊU MÔN HỌC (Course Goals)

Mục tiêu (1)	Mô tả mục tiêu (2)	CĐR của môn học tương ứng CTĐT (3)
G1	***Về kiến thức*** Sinh viên hiểu được những tri thức cơ bản, có tính hệ thống về sự ra đời của Đảng Cộng sản Việt Nam (1920-1930), sự lãnh đạo của Đảng đối với cách mạng Việt Nam trong thời kỳ đấu tranh giành chính quyền chính quyền (1930-1945), trong hai cuộc kháng chiến chống thực dân	

	Pháp và đế quốc Mỹ xâm lược (1945-1975), trong sự nghiệp xây dựng, bảo vệ Tổ quốc thời kỳ cả nước quá độ lên chủ nghĩa xã hội, tiến hành công cuộc đổi mới (1975 đến nay).	
G2	***Về kỹ năng*** Sinh viên vận dụng phương pháp tư duy khoa học về lịch sử để lựa chọn, khái quát hóa tài liệu nghiên cứu, học tập môn học; đồng thời sinh viên phân tích, đánh giá, vận dụng kiến thức lịch sử vào công tác thực tiễn.	
G3	***Về thái độ/năng lực tự chủ và trách nhiệm*** Sinh viên đánh giá được sự thật khách quan và nâng cao lòng tự hào, niềm tin đối với sự nghiệp lãnh đạo của Đảng và phê phán những quan niệm sai trái về lịch sử của Đảng.	

4. CHUẨN ĐẦU RA MÔN HỌC (Course learning outcomes)

CĐR (1)	**Mô tả CĐR (2)**	**Mức độ giảng dạy (3)**
G1.1	Hiểu được đối tượng, chức năng, nhiệm vụ nội dung và phương pháp nghiên cứu, học tập môn Lịch sử Đảng Cộng sản Việt Nam	I,U
G1.2	Hiểu được quá trình ra đời của Đảng Cộng sản Việt Nam (1920-1930), nội dung cơ bản, giá trị lịch sử của Cương lĩnh chính trị đầu tiên của Đảng và quá trình Đảng lãnh đạo cuộc đấu tranh giành độc lập, giành chính quyền (1930-1945)	I, T,U
G1.3	Hiểu được quá trình lãnh đạo của Đảng đối với hai cuộc kháng chiến chống thực dân Pháp và đế quốc Mỹ xâm lược, hoàn thành giải phóng dân tộc, thống nhất đất nước thời kỳ 1945-1975	I, T,U
G1.4	Hiểu được quá trình phát triển đường lối và sự lãnh đạo của Đảng để đưa cả nước quá độ lên chủ nghĩa xã hội và tiến hành công cuộc đổi mới từ sau ngày thống nhất đất nước năm 1975 đến nay. Những thành tựu và bài học kinh nghiệm trong quá trình lãnh đạo từ năm 1930 đến nay.	I, T,U
G2.1	Vận dụng kiến thức đã học để nhận thức, hành động theo đường lối của Đảng.	U
G2.2	Vận dụng, phân tích với tư duy độc lập trong nghiên cứu nhằm giải quyết các vấn đề khi làm việc theo nhóm và trình bày kết quả nghiên cứu.	U
G3.1	Đánh giá được sự lãnh đạo đúng đắn của Đảng Cộng sản Việt Nam đối với cách mạng nước ta. Quyết tâm phấn đấu thực hiện đường lối cách mạng của Đảng.	U

G3.2	Đánh giá được tầm quan trọng của sự nghiêm túc trong học tập và nghiên cứu, tự rèn luyện bản thân trở thành người có phẩm chất chính trị và đạo đức tốt.	U

5. ĐÁNH GIÁ MÔN HỌC

Thành phần đánh giá (1)	Bài đánh giá (2)	CĐR môn học (3)	Tỷ lệ % (4)
A1. Đánh giá quá trình	- Chuyên cần (A1.1) - Tham gia học tập trên lớp tích cực, hăng hái phát biểu (A1.2) - Thuyết trình nhóm (A1.3)	G1.1, G1.2-G1.3, G2.1, G2.2-G2.3 G3.1-G3.2	30%
A2. Đánh giá giữa kỳ	Kiểm tra giữa kỳ (A2.1)	G1.1 G2.1-G2.2, G3.1-G3.2	20%
A3. Đánh giá cuối kỳ	Thi cuối học kỳ (A3.1)	G1.2-G1.3, G2.1-G2.2, G3.1-G3.2	50%

6. KẾ HOẠCH GIẢNG DẠY CHI TIẾT

Tuần/Buổi học (1)	Nội dung (2)	Hoạt động dạy và học (3)	CĐRMH (4)
1/2 tiết	**Chương nhập môn** **ĐỐI TƯỢNG, CHỨC NĂNG, NHIỆM VỤ, NỘI DUNG VÀ PHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM** I. Đối tượng nghiên cứu của môn học lịch sử Đảng Cộng sản Việt Nam II. Chức năng, nhiệm vụ của môn học lịch sử Đảng Cộng sản Việt Nam III. Phương Pháp nghiên cứu, học tập môn lịch sử Đảng Cộng sản Việt Nam	**Hoạt động dạy:** - Giới thiệu đề cương môn học - Giới thiệu nội dung đề tài thuyết trình nhóm) - Trình chiếu, thuyết giảng **Hoạt động học:** - Chia nhóm - Giới thiệu nhóm học tập - Nghe giảng, phát biểu - Đọc trước mục 1, 2 phần I của chương 1	G1.1 G2.1 G2.2 G3.1 G3.2
	Chương 1 **ĐẢNG CỘNG SẢN VIỆT NAM RA ĐỜI VÀ LÃNH ĐẠO**	**Hoạt động dạy:** - Trình chiếu, thuyết giảng mục	

2/2 tiết	**ĐẤU TRANH GIÀNH CHÍNH QUYỀN (1930-1945)** I. Đảng cộng sản việt nam ra đời và cương lĩnh chính trị đầu tiên của Đảng (tháng 2 – 1930) *1. Bối cảnh lịch sử* *2. Nguyễn Ái Quốc chuẩn bị các điều kiện để thành lập Đảng*	1,2 phần I của chương 1 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 3,4 phần I của chương 1	G1.2 G2.1 G2.2 G3.1 G3.2
3/2 tiết	**Chương 1 (tiếp theo)** I. Đảng cộng sản việt nam ra đời và cương lĩnh chính trị đầu tiên của Đảng (tháng 2 – 1930) (tt) *3. Thành lập Đảng Cộng sản Việt Nam và Cương lĩnh chính trị đầu tiên của Đảng* *4. Ý nghĩa lịch sử của việc thành lập Đảng Cộng sản Việt Nam*	**Hoạt động dạy**: - Trình chiếu, thuyết giảng mục 3,4 phần I của chương 1 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 1, 2 phần II của chương 1	G1.1 G1.2 G2.1 G2.2 G3.1 G3.2
4/2 tiết	**Chương 1 (tiếp theo)** II. Lãnh đạo đấu tranh giành chính quyền (1930-1945) *1. Phong trào cách mạng 1930-1935 và khôi phục phong trào 1932-1935* *2. Phong trào dân chủ 1936-1939*	**Hoạt động dạy**: - Trình chiếu, thuyết giảng mục 1, 2 phần II của chương 1 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 3, 4 phần II của chương 1	G1.2 G2.1 G2.2 G3.1 G3.2

5/2 tiết	II. Lãnh đạo đấu tranh giành chính quyền (1930-1945) (tt) *3. Phong trào giải phóng dân tộc 1939-1945* *4. Tính chất, ý nghĩa và kinh nghiệm của Cách mạng Tháng Tám năm 1945*	**Hoạt động dạy:** - Trình chiếu, thuyết giảng mục 3, 4 phần II của chương 1 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học:** - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 1,2 phần I của chương 2	G1.2 G1.3 G2.1 G2.2 G3.1 G3.2
6/2 tiết	**Chương 2** **ĐẢNG LÃNH ĐẠO HAI CUỘC KHÁNG CHIẾN, HOÀN THÀNH GIẢI PHÓNG DÂN TỘC, THỐNG NHẤT ĐẤT NƯỚC (1945-1975)** I. Lãnh đạo xây dựng, bảo vệ chính quyền cách mạng, kháng chiến chống thực dân Pháp xâm lược 1945-1954 1. *Xây dựng và bảo vệ chính quyền cách mạng 1945-1946* *2. Đường lối kháng chiến toàn quốc và quá trình tổ chức thực hiện từ năm 1946 đến năm 1950*	**Hoạt động dạy:** - Trình chiếu, thuyết giảng mục 1, 2 phần I của chương 2 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học:** - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 3, 4 phần I của chương 2	G1.3 G2.1 G2.2 G3.1 G3.2
7/2 tiết	**Chương 2 (tiếp theo)** I. Lãnh đạo xây dựng, bảo vệ chính quyền cách mạng, kháng chiến chống thực dân Pháp xâm lược 1945-1954 (tt) *3. Đẩy mạnh cuộc kháng chiến đến thắng lợi 1951-1954* *4. Ý nghĩa lịch sử và kinh nghiệm của Đảng trong lãnh đạo kháng chiến chống Pháp và can thiệp Mỹ*	**Hoạt động dạy:** - Trình chiếu, thuyết giảng mục 3, 4 phần I của chương 2 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học:** - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 1 phần II của chương 2	G1.3 G2.1 G2.2 G3.1 G3.2

8/2 tiết	**Chương 2 (tiếp theo)** II. Lãnh đạo xây dựng chủ nghĩa xã hội ở miền bắc và kháng chiến chống đế quốc Mỹ xâm lược, giải phóng miền nam, thống nhất đất nước (1954-1975) *1. Sự lãnh đạo của Đảng đối với cách mạng hai miền Nam – Bắc 1954-1965*	**Hoạt động dạy**: - Trình chiếu, thuyết giảng mục 1 phần II của chương 2 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 2,3 phần II của chương 2	G1.3 G2.1 G2.2 G3.1 G3.2
9/2 tiết	**Chương 2 (tiếp theo)** II. Lãnh đạo xây dựng chủ nghĩa xã hội ở miền bắc và kháng chiến chống đế quốc Mỹ xâm lược, giải phóng miền nam, thống nhất đất nước (1954-1975) (tt) *2. Lãnh đạo cách mạng cả nước giai đoạn 1965-1975* *3. Ý nghĩa lịch sử và kinh nghiệm lãnh đạo của Đảng thời kỳ 1954-1975*	**Hoạt động dạy**: - Trình chiếu, thuyết giảng mục 2,3 phần II của chương 2 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Ôn tập nội dung chương 1,2	G1.3 G2.1 G2.2 G3.1 G3.2
10/2 tiết	**Chương 3** **ĐẢNG LÃNH ĐẠO CẢ NƯỚC QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI VÀ TIẾN HÀNH CÔNG CUỘC ĐỔI MỚI (1975 ĐẾN NAY)** I. Lãnh đạo cả nước xây dựng chủ nghĩa xã hội và bảo vệ tổ quốc (1975-1986) *1. Xây dựng chủ nghĩa xã hội và bảo vệ Tổ quốc 1975-1981*	**Hoạt động dạy**: - Trình chiếu, thuyết giảng mục 1 phần I của chương 3 - Đặt vấn đề và giải quyết vấn đề - Tổ chức kiểm tra giữa kỳ **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Thực hiện kiểm tra giữa kỳ - Đọc trước mục 2	G1.4 G2.1 G2.2 G3.1 G3.2

		phần I của chương 3	
11/2 tiết	**Chương 3 (tiếp theo)** I. Lãnh đạo cả nước xây dựng chủ nghĩa xã hội và bảo vệ tổ quốc (1975-1986) (tt) *1. Xây dựng chủ nghĩa xã hội và bảo vệ Tổ quốc 1975-1981 (tt)* *2. Đại hội đại biểu toàn quốc lần thứ V của Đảng và các bước đột phá tiếp tục đổi mới kinh tế 1982-1986*	**Hoạt động dạy**: - Trình chiếu, thuyết giảng mục 1 phần I của chương 3 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 1 phần II của chương 3	G1.4 G2.1 G2.2 G3.1 G3.2
12/2 tiết	**Chương 3 (tiếp theo)** II. Lãnh đạo công cuộc đổi mới, đẩy mạnh công nghiệp hóa, hiện đại hóa và hội nhập quốc tế (1986 đến nay) *1. Đổi mới toàn diện, đưa đất nước ra khỏi khủng hoảng kinh tế - xã hội 1986-1996*	**Hoạt động dạy**: - Trình chiếu, thuyết giảng mục 1 phần II của chương 3 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 2 phần II của chương 3	G1.4 G2.1 G2.2 G3.1 G3.2
13/2 tiết	**Chương 3 (tiếp theo)** II. Lãnh đạo công cuộc đổi mới, đẩy mạnh công nghiệp hóa, hiện đại hóa và hội nhập quốc tế (1986 đến nay) (tt) *1. Đổi mới toàn diện, đưa đất nước ra khỏi khủng hoảng kinh tế - xã hội 1986-1996 (tt)* *2. Tiếp tục công cuộc đổi mới, đẩy mạnh công nghiệp hóa, hiện đại hóa và hội nhập quốc tế 1996 đến nay*	**Hoạt động dạy**: - Trình chiếu, thuyết giảng mục 1, 2 phần II của chương 3 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước mục 3 phần II của chương	G1.4 G2.1 G2.2 G3.1 G3.2

		3	
14/2 tiết	**Chương 3 (tiếp theo)** II. Lãnh đạo công cuộc đổi mới, đẩy mạnh công nghiệp hóa, hiện đại hóa và hội nhập quốc tế (1986 đến nay) (tt) *2. Tiếp tục công cuộc đổi mới, đẩy mạnh công nghiệp hóa, hiện đại hóa và hội nhập quốc tế 1996 đến nay (tt)* *3. Thành tựu, kinh nghiệm của công cuộc đổi mới*	**Hoạt động dạy**: - Trình chiếu, thuyết giảng mục 2,3 phần II của chương 3 - Đặt vấn đề và giải quyết vấn đề **Hoạt động học**: - Nghe giảng, thuyết trình, thảo luận nhóm. - Đọc trước phần kết luận	G1.4 G2.1 G2.2 G3.1 G3.2
15/2 tiết	**KẾT LUẬN** *1. Những thắng lợi vĩ đại của cách mạng Việt Nam.* *2. Những bài học lớn về sự lãnh đạo của Đảng*	**Hoạt động dạy**: - Hướng dẫn sv tự học - Ôn tập tổng kết môn học - Công bố bảng điểm chi tiết các hoạt động - Giải đáp thắc mắc **Hoạt động học**: - Nghe giảng, phát biểu - Ôn tập toàn bộ nội dung môn học tại nhà	G1.1 G1.2 G1.3 G1.4 G2.1 G2.2 G3.1 G3.2

7. QUY ĐỊNH CỦA MÔN HỌC (Course requirements and expectations)

- Quy định về Bài thuyết trình nhóm:
  - Thành lập nhóm: Số lượng sinh viên tùy vào sĩ số lớp, do giảng viên quy định. Hạn chót đăng ký đề tài nhóm Quản lý trên forum/Moodle là Buổi 2 hoặc trực tiếp nộp cho GV buổi 1.
  - Các nhóm thuyết trình theo thứ tự được phân công. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan khi thuyết trình.
  - Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV
- Quy định về giờ giấc, chuyên cần, kỷ luật trong khóa học: Lên lớp đúng giờ, dự tối thiểu 80% thời gian học trên lớp (chỉ được phép vắng mặt tối đa 20% số tiết học). Nếu vắng quá số tiết quy định sẽ bị điểm 0 chuyên cần.

8. TÀI LIỆU HỌC TẬP, THAM KHẢO (Reference)

Giáo trình:

[1] Bộ Giáo dục và Đào tạo (2021), *Giáo trình Lịch sử Đảng Cộng sản Việt Nam* (dành cho bậc đại học hệ không chuyên lý luận chính trị), NXB. Chính trị Quốc gia Sự Thật, Hà Nội.

Tài liệu khác:

[1] Hội đồng Trung ương chỉ đạo biên soạn giáo trình quốc gia các môn khoa học Mác – Lênin, Tư tưởng Hồ Chí Minh (2019), Giáo trình Lịch sử Đảng Cộng sản Việt Nam (tái bản có sửa chữa, bổ sung), Nxb. Chính trị quốc gia, Hà Nội.

[2] Bộ Giáo dục và Đào tạo (2017), Giáo trình Đường lối cách mạng của Đảng Cộng sản Việt Nam, Nxb Chính trị quốc gia, Hà Nội.

Tp. Hồ Chí Minh, ngày 01 tháng 10 năm 2023

KT. Trưởng Bộ môn	**KT. TRƯỞNG KHOA**
Phó trưởng Bộ môn	**PHÓ TRƯỞNG KHOA**
Lê Văn Thông	**TS. Nguyễn Đình Quốc Cường**

ĐẠI HỌC QUỐC GIA TP.HCM
KHOA CHÍNH TRỊ - HÀNH CHÍNH

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

ĐỀ CƯƠNG CHI TIẾT HỌC PHẦN

(DÀNH CHO TRƯỜNG ĐẠI HỌC QUỐC TẾ)

1. **Thông tin về giảng viên (cung cấp cho sinh viên khi giảng dạy)**
   - Họ và tên:
   - Chức danh, học hàm, học vị:
   - Đơn vị công tác: **Khoa Chính trị - Hành chính, ĐHQG-HCM**
   - Thời gian và địa điểm làm việc:…
   - Địa chỉ liên hệ:
   - Điện thoại, email:
   - Thông tin về trợ giảng (nếu có) (họ và tên, địa chỉ liên hệ, điện thoại, e-mail):
2. **Thông tin chung về học phần**
   - Mã học phần: PE019IU
   - Tên học phần: **Tư tưởng Hồ Chí Minh**
   - Tên học phần bằng tiếng Anh: **Ho Chi Minh's Thoughts**
   - Số tín chỉ: 02 (30 tiết).
   - Cấu trúc/cơ cấu học phần:
     - Số tiết lý thuyết: *30 tiết*
     - Số tiết thực hành:
     - Số tiết bài tập:
     - Khác: Số tiết tự học: *60 tiết*
   - Loại học phần thuộc khối kiến thức (check vào các ô):
     - Kiến thức đại cương: ☑
     - Kiến thức cơ sở ngành: ☐
     - Kiến thức chuyên ngành: ☐
     - Kiến thức bổ trợ: ☐
     - Khóa luận tốt nghiệp: ☐
     - Đồ án/dự án/seminar tốt nghiệp: ☐
     - Khác:….
   - Các học phần tiên quyết: **không** hoặc **có**, nếu **có** thì điền các thông tin sau
   - Các học phần học trước học phần này: **không** hoặc **có**, nếu **có** thì điền các thông tin sau
     - …….
     - …….
   - Học phần song hành: **không** hoặc **có**, nếu **có** thì điền các thông tin sau
     - …….

- .....
- Các yêu cầu khác (nếu có):.....
- Bộ môn phụ trách học phần: Lý luận và Khoa học chính trị, Khoa Chính trị - Hành chính

3. Mô tả vắn tắt nội dung học phần: (*trình bày ngắn gọn vai trò, vị trí học phần/môn học, kiến thức sẽ trang bị cho sinh viên, quan hệ với các học phần/môn học khác trong chương trình đào tạo*)

Môn học thuộc phần kiến thức giáo dục đại cương trong khối kiến thức cơ bản về lý luận chính trị Trang bị cho sinh viên những kiến thức cơ bản về: Đối tượng, phương pháp nghiên cứu và ý nghĩa học tập môn tư tưởng Hồ Chí Minh; về cơ sở, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh; về độc lập dân tộc và chủ nghĩa xã hội; về Đảng Cộng sản và Nhà nước Việt Nam; về đại đoàn kết dân tộc và đoàn kết quốc tế; về văn hóa, đạo đức, con người.

4. Mục tiêu của học phần

- **Mục tiêu chung**:

+ Sinh viên **hiểu** được những nội dung cơ bản của tư tưởng Hồ Chí Minh về con đường cách mạng Việt Nam; về độc lập dân tộc gắn liền với chủ nghĩa xã hội; về Đảng Cộng sản Việt Nam; về Nhà nước pháp quyền xã hội chủ nghĩa Việt Nam; về đại đoàn kết dân tộc và đoàn kết quốc tế; về văn hóa, đạo đức và con người...

+ Sinh viên **vận dụng** được những kiến thức cơ bản của tư tưởng Hồ Chí Minh vào trong nhận thức và trong hoạt động thực tiễn của bản thân.

+ Sinh viên **phân tích, đánh giá** được giá trị, tính khoa học cách mạng và nhân văn của tư tưởng Hồ Chí Minh đối với thực tiễn Việt Nam và nhân loại.

- **Mục tiêu cụ thể:**

Ký hiệu mục tiêu của học phần (G)	Mô tả/nội dung mục tiêu học phần	Mức độ năng lực đạt được (theo thang đánh giá Bloom)	Ghi chú
	KIẾN THỨC		
G1.1	Sinh viên hiểu những kiến thức cơ bản về khái niệm; cơ sở, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh; tư tưởng Hồ Chí Minh về độc lập dân tộc gắn liền với chủ nghĩa xã hội;	2	
G1.2	Sinh viên hiểu những nội dung cơ bản của tư tưởng Hồ Chí Minh về Đảng Cộng sản Việt Nam; về Nhà nước của nhân dân, do nhân dân, vì nhân dân; về sự vận dụng của Đảng Cộng sản Việt Nam trong cách mạng dân tộc dân chủ và cách mạng xã hội chủ nghĩa, trong công cuộc đổi mới đất nước hiện nay.	2	
G1.3	Sinh viên hiểu những nội dung cơ bản của tư tưởng Hồ Chí Minh về đại đoàn kết dân tộc và đại đoàn kết quốc tế; hiểu những nội dung cơ bản của tư tưởng Hồ Chí Minh về văn hóa, đạo đức và con	2	

	người.		
KỸ NĂNG			
G2.1	Sinh viên vận dụng giá trị của tư tưởng Hồ Chí Minh trong hoạt động lý luận và thực tiễn; Sinh viên phân tích, nhận diện và phản bác những luận điệu xuyên tạc về tư tưởng Hồ Chí Minh về độc lập dân tộc và chủ nghĩa xã hội.	3	
G2.2	Sinh viên phân tích được một cách khoa học những vấn đề về xây dựng Đảng cộng sản Việt Nam và xây dựng Nhà nước pháp quyền xã hội chủ nghĩa của nhân dân, do nhân dân, vì nhân dân trong thời kỳ đổi mới đất nước.	4	
G2.3	Sinh viên vận dụng tư tưởng Hồ Chí Minh về đại đoàn kết dân tộc và đoàn kết quốc tế trong giai đoạn hiện nay; Sinh viên vận dụng được phương pháp tư duy mới trong học tập, nghiên cứu; tự mình biết đào sâu lý luận gắn với thực tiễn với tinh thần độc lập, sáng tạo.	3	
THÁI ĐỘ			
G3.1	Sinh viên vận dụng, học tập và làm theo tư tưởng, đạo đức, phong cách Hồ Chí Minh trong học tập và cuộc sống hằng ngày.	3	
G3.2	Sinh viên đánh giá được bản chất khoa học và cách mạng của tư tưởng Hồ Chí Minh, từ đó có bản lĩnh chính trị vững vàng, có lòng yêu nước nồng nàn, trung thành với mục tiêu lý tưởng của Đảng, của dân tộc. Trung thực, thẳng thắn, xây dựng tập thể đoàn kết. Trân trọng, giữ gìn và phát huy di sản tư tưởng của Hồ Chí Minh trong hoạt động thực tiễn.	5	
G3.3	Sinh viên vận dụng bản chất khoa học và cách mạng của tư tưởng Hồ Chí Minh trong việc đấu tranh chống lại các âm mưu xuyên tạc tư tưởng Hồ Chí Minh, chủ trương, đường lối của Đảng. Có hành vi đạo đức chuẩn mực. Có năng lực học tập, tự nghiên cứu các vấn đề chuyên môn.	3	

(*) 1. Ghi nhớ (Remembering), 2. Hiểu (Understanding), 3. Vận dụng (Applying), 4. Phân tích (Analyzing), 5. Đánh giá (Evaluating), 6. Sáng tạo (Creating).

5. Chuẩn đầu ra (CĐR) của học phần

Thứ tự các	Ký hiệu CĐR	Mô tả/nội dung CĐR học phần	Mức độ giảng dạy	Liên kết giữa CĐR	Liên kết giữa CĐR học

CĐR	học phần (CHP)		(I, T, U) *	học phần và mục tiêu học phần	phần và CĐR chương trình đào tạo
KIẾN THỨC					
1	CHP1	Hiểu được khái niệm, đối tượng, phương pháp nghiên cứu và ý nghĩa học tập môn tư tưởng Hồ Chí Minh.	I	G1.1	
2	CHP2	Hiểu được cơ sở, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh.	I, T, U	G1.1	
3	CHP3	Hiểu được kiến thức cơ bản tư tưởng Hồ Chí Minh về độc lập dân tộc và chủ nghĩa xã hội. Sự vận dụng của Đảng vào trong sự nghiệp cách mạng hiện nay.	I, T,U	G1.1	
4	CHP4	Hiểu được kiến thức cơ bản tư tưởng Hồ Chí Minh về Đảng Cộng Sản Việt Nam và Nhà nước của nhân dân, do nhân dân, vì nhân dân. Sự vận dụng tư tưởng Hồ Chí Minh vào công tác xây dựng Đảng và xây dựng Nhà nước.	I, T,U	G1.2	
5	CHP5	Hiểu được kiến thức cơ bản tư tưởng Hồ Chí Minh về đại đoàn kết toàn dân tộc và đoàn kết quốc tế. Sự vận dụng của Đảng vào trong sự nghiệp cách mạng hiện nay;	I, T,U	G1.3	
6	CHP6	Hiểu được kiến thức cơ bản tư tưởng Hồ Chí Minh nề văn hóa, đạo đức, con người. Sự vận dụng tư tưởng Hồ Chí Minh trong việc xây dựng văn hóa, đạo đức, con người Việt Nam hiện nay.	I, T,U	G1.3	
KỸ NĂNG					
7	CHP7	Phân tích mang tính khái quát hóa để rút ra *Từ khóa tri thức* đối với mỗi nội dung và tư duy có hệ thống.	T, U	G2.1; G2.2; G2.3	
8	CHP8	Vận dụng kiến thức học phần để trình bày, thuyết	U	G2.1; G2.2;	

		minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn.		G2.3	
9	CHP9	Vận dụng kiến thức học phần để giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức và kinh nghiệm, khả năng điều hành nhóm làm việc.	U	G2.1; G2.2; G2.3	
THÁI ĐỘ					
10	CHP10	Phân tích, đánh giá và có ý thức trách nhiệm bảo vệ tính khoa học, cách mạng, nhân văn của tư tưởng Hồ Chí Minh.	T, U	G3.1 G3.2 G3.3	
11	CHP11	Vận dụng kiến thức đã học gắn với trách nhiệm cá nhân đối với tập thể, cộng đồng.	U	G3.1 G3.2 G3.3	
12	CHP12	Phân tích, đánh giá được sự cần thiết của việc học tập, nghiên cứu suốt đời và vận dụng tư tưởng Hồ Chí Minh trong cuộc sống.	T, U	G3.1 G3.2 G3.3	

(*) I (Introduce): giới thiệu; T (Teach): dạy; U (Utilize): sử dụng

6. Hình thức, phương pháp và trọng số đánh giá kết quả học phần

Hình thức đánh giá	**Nội dung chi tiết**	**Phương pháp đánh giá (đánh dấu X)**				**Ký hiệu bài đánh giá**	**Trọng số đánh giá**	**Ghi chú**
		Viết	Trắc nghiệm	Vấn đáp	Khác			
Đánh giá quá trình	- Chuyên cần - Tham gia học tập trên lớp tích cực, hăng hái phát biểu. -Thuyết trình nhóm					ĐG1 (tổng điểm từ ĐG1.1 đến ĐG1.6)	**30%**	
Điểm kiểm tra giữa kỳ		X	X	X		ĐG1.1	**20%**	

Đánh giá tổng kết	Điểm cuối học kỳ	X				ĐG2	**50%**	Điểm bài thi + điểm thưởng (tối đa 20%=2 điểm)

7. **Thang điểm đánh giá:** theo thang điểm 100.

8. **Kế hoạch giảng dạy chi tiết của học phần : Ghi chi tiết đến 2 cấp (chương và bài).**

STT Buổi (3 tiết/ buổi)	**Tên bài giảng của học phần** ***(Ghi chi tiết tên chương và bài giảng của mỗi chương)***	**Liên kết với CĐR học phần**	**Hoạt động dạy và học**						**Phương pháp dạy học** (thuyết trình; thảo luận; các phương pháp dạy học tích cực/lấy người học làm trung tâm…)	**Bài đánh giá**
			Số tiết lên lớp				**SV tự nghiên cứu, tự học**			
			Lý thuyết	**Thực hành/ thực tập**	**Bài tập**	**Thảo luận/ khác**	**Số tiết**	**Ghi chú (nếu có)**		
1/2	Chương 1. Khái niệm, đối tượng, phương pháp nghiên cứu và ý nghĩa học tập môn tư tưởng Hồ Chí Minh		02						Thuyết trình	ĐG1.1; ĐG1.6; ĐG2
2/2	Chương 2. Cơ sở, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh		02						Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
3/2	Chương 2 (tiếp)		01			01			Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
4/2	Chương 2 (tiếp)		02						Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
5/2	Chương 3. Tư tưởng Hồ Chí								Thuyết trình,	ĐG1.1; ĐG1.3;

	Minh về độc lập dân tộc và chủ nghĩa xã hội		02						thảo luận nhóm	ĐG1.5; ĐG1.6; ĐG2
6/2	Chương 3(tiếp)		01			01			Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
7/2	Chương 3(tiếp)		01			01				
8/2	Chương 4. Tư tưởng Hồ Chí Minh về Đảng Cộng sản Việt Nam và Nhà nước của nhân dân, do nhân dân và vì nhân dân		02						Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
9/2	Chương 4 (tiếp)		02						Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
10/2	Chương 4 (tiếp)					02			Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
11/2	Chương 5. Tư tưởng Hồ Chí Minh về đại đoàn kết toàn dân tộc và đoàn kết quốc tế		02						Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
12/2	Chương 5 (tiếp)		01			01			Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
13/2	Chương 6. Tư tưởng Hồ Chí Minh về văn hóa, đạo đức, con người		02						Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
14/2	Chương 6 (tiếp)		02						Thuyết trình, thảo luận nhóm	ĐG1.1; ĐG1.3; ĐG1.5; ĐG1.6; ĐG2
15/2	Chương 6 (tiếp)					02			Thuyết trình, thảo	ĐG1.1; ĐG1.3; ĐG1.5;

									luận nhóm	ĐG1.6; ĐG2
	Tổng cộng số tiết		22	…	…	08	…	…		

9. Tài liệu học tập

STT	Tên tác giả	Năm xuất bản	Tên giáo trình	Tên Nhà xuất bản	Giáo trình chính/Tài liệu tham khảo/Khác	Nơi có thể có tài liệu/trang web
1	Bộ Giáo dục và Đào tạo	2021	*Giáo trình Tư tưởng Hồ Chí Minh*	Nxb. Chính trị quốc gia Sự thật, Hà Nội.	Giáo trình chính	
2	Hồ Chí Minh	2011	*Toàn tập*	Nxb. Chính trị quốc gia Sự thật, Hà Nội.	Tài liệu tham khảo	Báo điện tử Đảng Cộng sản Việt Nam, https://hochiminh.vn/tac-pham-cua-ho-chi-minh/ho-chi-minh-toan-tap
3	Hồ Chí Minh	2016	*Biên niên tiểu sử*	Nxb. Chính trị quốc gia Sự thật, Hà Nội.	Tài liệu tham khảo	

10. Quy định của môn học

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Lý luận và Khoa học chính trị và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn

- Quy định về Bài thuyết trình nhóm:

+ Thành lập nhóm: Theo tình hình thực tế của lớp học.

+ Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2.

+ Bắt đầu từ tuần 4 thuyết trình theo thứ tự. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến bài tập khi đi thuyết trình.

+ Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV

- Quy định về đánh giá môn học: theo Quy định về việc giảng dạy và học tập các môn Lý luận chính trị của khoa Chính trị - Hành chính.

Tp. Hồ Chí Minh, ngày 01 tháng 10 năm 2023

KT. Trưởng Bộ môn	**KT. TRƯỞNG KHOA**
Phó trưởng Bộ môn	**PHÓ TRƯỞNG KHOA**
Lê Văn Thông	**TS. Nguyễn Đình Quốc Cường**

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Languages

COURSE SYLLABUS
Course Name: Writing AE1
Course Code: **EN007IU**

1. General information

Course name	- *(in English)* **WRITING AE1 (Academic Writing)** - *(in Vietnamese) Viết học thuật*
Course designation	*This course provides students with comprehensive instructions and practice in essay writing, including transforming ideas into different functions of writing such as process, cause-effect, comparison-contrast, and argumentative essays.*
Semester(s) in which the course is taught	1, 2, 3
Person responsible for the course	Lecturers of School of Languages
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (lecture, exercise): 30 Private study including examination preparation, specified in hours[1]: 60
Credit points	2 credits (Theory: 2 + Practice: 0) 3.08 ECTS *(optional)*
Required and recommended prerequisites for joining the course	None

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Course objectives</td><td>Throughout the whole course, students are required to read university-level texts to develop the ability to read critically and to respond accurately, coherently and academically in writing. Through providing them with crucial writing skills such as brainstorming, paraphrasing, idea developing, revising, and editing, this course prepares the students for research paper writing in the next level of AE2 writing.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course, students will be able to:
<table>
<tr><td>Competency level</td><td>Course learning outcome (CLO)</td></tr>
<tr><td>Knowledge</td><td>CLO1. Follow different steps in the writing process to produce a complete essay</td></tr>
<tr><td>Skill</td><td>CLO2. Use signal language that are specific for different functions (describe a process, discuss the causes and effects, compare and contrast, and make arguments)
CLO3. Construct a complete essay including appropriately written thesis statement, topic sentences, and restatement
CLO4. Provide a counter-argument and a rebuttal in an argumentative essay.</td></tr>
<tr><td>Attitude</td><td>CLO5. Display discipline, responsibilities, and ethical practices as an individual and a team member in attending class regularly and actively participating in class activities</td></tr>
</table></td></tr>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (2 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><td>Topic</td><td>Weight</td><td>Level</td></tr>
<tr><td>The process of Academic Writing</td><td>1</td><td>I, T, U</td></tr>
<tr><td>Paraphrasing</td><td>1</td><td>T, U</td></tr>
<tr><td>From Paragraph to Essay</td><td>4</td><td>T, U</td></tr>
<tr><td>Process Essays</td><td>4</td><td>T, U</td></tr>
<tr><td>Cause/Effect Essays</td><td>4</td><td>T, U</td></tr>
<tr><td>Comparison/ Contrast Essays</td><td>6</td><td>T, U</td></tr>
<tr><td>Argumentative Essays</td><td>6</td><td>T, U</td></tr>
<tr><td>Test, Review & Correction</td><td>4</td><td>U</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Essay writing</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance
Regular on-time attendance in this course is expected. A student will be allowed no more than three absences. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination.</td></tr>
</table>

	Missed Tests Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may re-take the examination. *Class Behaviors* Students are required to treat their studying in college as a full-time job and spend an adequate amount of time for this Writing AE1 course with approximately 8-10 hours per week (both in class and self-study). Accordingly, students are supposed to follow the obligations below: - Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request. - Participate fully and constructively in all course activities and discussions (if any). - Display appropriate courtesy to all involved in the class. - Provide constructive feedback to faculty members regarding their performance. *Plagiarism* Students are warned not to copy from other books or from their peers for all assessment tasks. Committing plagiarism will result in 0 point for the task. Students who plagiarize twice will be prohibited from sitting the final examination. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	[1] Oshima, A., & Hogue, A. (2017). *Longman Academic Writing Series, Level 4: Essays* (5th ed.). New Jersey, NJ: Pearson Longman. [2] Oshima, A., & Hogue, A. (2006). *Longman Academic Writing Series, Level 4: Essays* (4th ed.). New Jersey, NJ: Pearson Longman.

2. Learning Outcomes Matrix (optional)

3. Planned learning activities and teaching methods

Week	Topic	CLO	Learning activities	Assessments	Resources
1	**The process of Academic Writing** Step 1: Creating (Prewriting) Step 2: Planning (Outlining) Step 3: Writing Step 4: Polishing ***Using Outside Sources*** Paraphrasing	**1, 5**	Lecture Group work Individual writing	Ongoing assessment & Midterm test	[2] pp. 265-279 [1] pp. 58- 65

Week	Topic	CLO	Learning activities	Assessments	Resources
	Plagiarism and how to avoid plagiarism				
2 & 3	**From Paragraph to Essay** The introductory paragraph: ● General statements & Introductory techniques ● Thesis statements & Logical division of ideas Body paragraphs: ● Topic sentences The concluding paragraph: ● Restatement Final thoughts Outlines of essays	**1,3,5**	Lecture Group work Individual writing	Ongoing assessment & Midterm test	[1] pp. 74– 100
4	**Process Essays** Introduction Analyzing the models Thesis statements for process essays Transitional signals	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Midterm test	[1] pp. 101-115
5	**Process Essays (Cont'd)** ***In-class Assignment 1*** **Review/ Correction**: Lecturer gives feedback to one or two students' writings in class.	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Midterm test	[1] pp. 101-115
6	**Cause/ Effect Essays** Introduction Analyzing the models Organization Signal words and phrases	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Midterm test	[1] pp. 116-132
7	**Cause/ Effect Essays (Cont'd)** In-class practice Review/ Correction: Lecturer gives feedback to students' writings in class.	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Midterm test	[1] pp. 116 - 132
8	**MIDTERM TEST**				
9	**Comparison/ Contrast Essays** Introduction Analyzing the models Organization: ● Points of comparison	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Final exam	[1] pp. 133-151

Week	Topic	CLO	Learning activities	Assessments	Resources
	● Point-by-point organization ● Block organization Comparison and Contrast signal words				
10	**Comparison/ Contrast Essays (Cont'd)** In-class practice Review/ Correction: Lecturer gives feedback to students' writings in class.	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Final exam	[1] pp. 133-151
11	**Comparison/ Contrast Essays (Cont'd)** **In-class Assignment 2** **Review/ Correction**: Lecturer gives feedback to one or two students' writings in class.	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Final exam	[1] pp. 133-151
12	**Argumentative Essays** Introduction Analyzing the model Organization: Block vs. Point-by-point pattern The elements of an argumentative essay: ● An explanation of the issue ● A clear thesis statement ● A summary of the opposing arguments ● Rebuttals to the opposing arguments ● Your own arguments The introductory paragraph: Thesis Statement Statistics as support	**2,3,4,5**	Lecture Group work Individual writing	Ongoing assessment & Final exam	[1] pp. 152-168
13	**Argumentative Essays (Cont'd):** In-class practice: - A summary of the opposing arguments - Rebutting an argument - Timed writing	**2,4**	Lecture Group work Individual writing	Ongoing assessment & Final exam	[1] pp. 152-168

Week	Topic	CLO	Learning activities	Assessments	Resources
14	**Argumentative Essays (Cont'd) Review/ Correction:** Lecturer gives feedback to one or two students' writings in class.	**2,3,4,5**	Lecture Group work Individual writing	Ongoing assessment & Final exam	[1] pp. 152-168
15	**Sample final examination**	**2,3,4,5**	Individual writing	Ongoing assessment & Final exam	

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Ongoing assessment (30%)	60% Pass	60% Pass	60% Pass	60% Pass	60% Pass
Midterm test (20%)	60% Pass	60% Pass	60% Pass		
Final exam (50%)	60% Pass	60% Pass	60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Midterm test rubrics (100 points)

TASK 1: Write 3 topic sentences and the restatement from a thesis statement: 40 points

Parts/ Points	Answers/ Criteria	CLO
Topic sentence 1 10 pts	○ The topic sentence introduces the topic and the controlling idea (1), starting with a transition signal*.	CLO 3
Topic sentence 2 10 pts	○ The topic sentence introduces the topic and the controlling idea (2), starting with a transition signal*.	CLO 3
Topic sentence 3 10 pts	○ The topic sentence introduces the topic and the controlling idea (3), starting with a transition signal*.	CLO 3
Restatement 10 pts	○ The 3 subtopics are well paraphrased: different words and structures while the meaning kept the same.	CLO 3

Notes:

The students are supposed to use **a variety of connecting devices (single word, phrase, clause, or sentence) to show their flexibility and expertise in writing.*

TASK 2: Write a Cause/Effect essay: 60 points

Answers/ Criteria	Parts/ Points	CLO
Language use and Mechanics A wide variety of sentence patterns and vocabulary are presented correctly. Language used for *Cause-Effect Essay* is good and Meaning is clear. Spelling, capitalization, punctuations are correct.	**10**	CLO 2

Answers/ Criteria	Parts/ Points	CLO
Content The essay fulfills the requirements of the assignment & the topic is fully addressed. (15) The essay is interesting to read and originally written by the student. (5)	**20**	CLO 3
Organization ***Introduction:*** The introduction ends with a thesis statement. (10) ***Body:*** Each paragraph discusses a particular point and begins with a clear topic sentence. (5) Each paragraph has specific supporting details (fact, examples, etc.) (5) Each paragraph has cohesion and coherence. (5) ***Conclusion:*** The conclusion summarizes the main points/paraphrases the thesis statement, begins with a conclusion signal, and leaves the readers with the writer's thoughts on the topic. (5)	**30**	CLO 1,3,5
Total	**60**	

5.2. Final exam rubrics: Write an argumentative essay: 100 points

Criteria/ word count	300-350 words (100%)	CLO
Language use and mechanics (20) A wide variety of sentence patterns and vocabulary are presented correctly. Language control is good, and meaning is clear. Spelling, capitalization and punctuation are correct.	20	CLO 2
Content: (20) The essay fulfills the task requirements, and the topic is fully addressed. The content is originally created by the students.	20	CLO 3
Organization: (60) ***Introduction***: The introduction has a thesis statement. (10) ***Body***: At least one paragraph discusses the counter-arguments. (10) Each paragraph discusses a particular point and begins with a clear topic sentence. (10) Each paragraph has specific supporting details (fact, examples, etc.). There are no sentences that are off-topic. (10) Each paragraph has cohesion and coherence. There are transition signals to show	10 10 10 10	CLO 1,3,4

the relationship among ideas and to link paragraphs. (10) ***Conclusion***: The conclusion summarizes the main points and paraphrases the thesis statement, begins with a conclusion signal, and leaves the readers with the writer's final thought on the topic. (10)	10 10	
Total	**100**	

Revised date: June 5th, 2025

Ho Chi Minh City, June 6th, 2025
Vice Dean of School of Languages
(Signature)

Dr. Vu Hoa Ngan

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Languages

COURSE SYLLABUS

Course Name: Listening AE1

Course Code: **EN008IU**

1. General information

Course name	- *(in English)* **LISTENING AE1 (Listening and Note-taking)** - *(in Vietnamese) Nghe AE1 (Nghe và ghi chú)*
Course designation	*The course is designed to prepare students for effective listening and note-taking skills, so that they can pursue the courses in their majors without considerable difficulty. The course is therefore lecture-based in that the teaching and learning procedure is built up on lectures on a variety of topics such as business, science, and humanities.*
Semester(s) in which the course is taught	1, 2, 3
Person responsible for the course	Lecturers of School of Languages
Language	English
Relation to curriculum	**Compulsory**
Teaching methods	Lectures, lesson Individual practice Discussion Pair work Group work
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (lecture, exercise): 30 Private study including examination preparation, specified in hours[1]: 60
Credit points	2 credits (Theory: 2 + Practice: 0) 3.08 ECTS *(optional)*
Number of periods	Theory: 30 Practice: 0

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>There are a number of objectives embedded in various teaching activities in Listening AE1 course:
- Pre-listening activities: aim to activate students’ current knowledge of the topic, and to provide them with lecture language and effective strategies in listening and note-taking to prepare themselves for the coming lecture. These activities include reading (this can be done before class meetings), discussing and reviewing what they have learned from the reading.
- While-listening and post-listening activities: aim to enable students to put their newly activated knowledge and acquired strategies into work by taking notes on the lecture, using the outline given by the teacher or prepared by themselves. They are later on asked to assess their understanding based on their notes and discuss them with their classmates. Finally, as an optional activity, depending on time and students’ needs, students are asked to summarize the lecture.
- Follow-up activities: students are required to discuss the lecture topic and to prepare arguments for or against the topic in the debate. The purpose is to enhance students’ comprehension of the lecture, and to allow them to put their acquired academic language into practice, and to experience the atmosphere of a university lecture class.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course, students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1. Apply knowledge of lecture language in listening comprehension via giving accurate information</td></tr>
<tr><td>Skill</td><td>CLO2. Demonstrate appropriate listening strategies and note-taking skills in taking organized notes of academic lectures.
CLO3. Perform listening comprehension in writing a summary of a lecture.</td></tr>
<tr><td>Attitude</td><td>CLO4. Display discipline, responsibilities, and ethical practices as an individual and a team member in attending class regularly and actively participating in class activities</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Content</td><td>

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (2 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Orientation & Introduction of strategies and techniques in note-taking	2	I, T, U
Chapter 1: New Trends in Marketing Research	3	T, U
Chapter 2: Business Ethics	3	T, U
Chapter 3: Trends in Children's Media Use	2	T, U
Chapter 4: The Changing Music Industry	2	T, U
Chapter 5: The Placebo Effect	2	T, U
Midterm Sample Test & Review	2	T, U
Chapter 6: Intelligent Machines	3	T, U
Chapter 7: Sibling Relationships	3	T, U
Chapter 8: Multiple Intelligences	3	T, U
Chapter 9: The Art of Graffiti	3	T, U
Final Sample Test & Review	2	T, U

</td></tr>
<tr><td>Examination forms</td><td>Paper-based tests: True-False questions, short-answer questions, open-ended questions (such as writing a summary paragraph)</td></tr>
<tr><td>Study and examination requirements</td><td>

Attendance

Regular on-time attendance in this course is expected. It is compulsory that students attend atleast 80% of the course to be eligible for the final examination.

Missed tests

Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students re-take the tests.)

Class behavior

Students are supposed to:

- prepare thoroughly for each class in accordance with the syllabus and complete allassignments upon the instructor's request
- participate fully and constructively in all class activities (and discussions if any)
- display appropriate courtesy to all involved in the class
- provide constructive feedback to faculty members regarding their performance

Assignments/Examination: Students must have more than 50/100 points overall to pass this course.

</td></tr>
</table>

Reading list	[1] Frazie, L., & Leeming, S. (2013). *Lecture ready 3.* Oxford: Oxford University Press. References: [2] Frazie, L., & Leeming, S. (2013). *Lecture ready 1, 2.* Oxford: Oxford University Press.

2. Learning Outcomes Matrix (optional)

3. Planned learning activities and teaching methods

Week	Topic	CLO	Learning activities	Assessments	Resources
1	**ORIENTATION** **<u>Chapter 1</u>** **New Trends inMarketing Research** Recognizing topic introducing and lectureplan presenting expressions Organizing ideas by outlining	**1, 2, 4**	Lecture Group work Individual task	Ongoing assessment Midterm test	**[1] p.2-13**
2	**<u>Chapter 2</u> Business Ethics** Recognizing transition expressions Using symbols and abbreviations	**1, 2, 4**	Lecture Group work Individual task	Ongoing assessment Midterm test	**[1] p.14-25**
3	**REVIEW**	**1, 2, 4**		Ongoing assessment Midterm test	**Designed by lecturer**
4	**<u>Chapter 3</u>** **Trends in Children's Media Use** Recognizing generalization and support expressions	**1, 2, 4**	Lecture Group work Individual task	Ongoing assessment Midterm test	**[1] p.28-39**
5	**<u>Chapter 4</u>** **The Changing Music Industry** Recognizing expressions for clarification or emphasis Organizing notes byusing a split-page format	**1, 2, 4**	Lecture Group work Individual task	Ongoing assessment Midterm test	**[1] p.40-52**
6	**<u>Chapter 5</u>** **The Placebo Effect** Recognizing cause andeffect expressions	**1, 2, 4**	Lecture Group work	Ongoing assessment Midterm test	**[1] p.54-65**

Week	Topic	CLO	Learning activities	Assessments	Resources
	Noting causes and Effects		Individual task		
7	**REVIEW** **SAMPLE MIDTERM EXAM + CORRECTION**	**1, 2, 4**		Ongoing assessment Midterm test	**Designed by lecturer**
8	**MIDTERM TEST**				
9	**<u>Chapter 6</u> IntelligentMachines** Recognizing expressions used topredict causes and effects Using arrows to showthe relationship between causes and effects	**1-4**	Lecture Group work Individual task	Ongoing assessment Final exam	**[1] p.66-78**
10	**<u>Chapter 7</u> Sibling Relationships** Recognizing expressions of comparison and contrast Noting comparison and contrast	**1-4**	Lecture Group work Individual task Lecture Group work Individual task	Ongoing assessment Final exam	**[1] p.80-91**
11	**REVIEW** **<u>In-class assignment</u>**	**1-4** **1, 2, 4**		Ongoing assessment Final exam	**Designed by lecturer**
12	**<u>Chapter 8</u> Multiple Intelligences** Recognizing non-verbalsignals indicating important information Representing information in list form	**1-4**	Lecture Group work Individual task	Ongoing assessment Final exam	**[1] p.92-104**
13	**<u>Chapter 9</u>** **The Art of Graffiti** Recognizing expressions of definition Reviewing and practicing all note taking strategies	**1-4**	Lecture Group work Individual task	Ongoing assessment Final exam	**[1] p.105-117**
14	**REVIEW**	**1-4**		Ongoing assessment Final exam	**Designed by lecturer**

Week	Topic	CLO	Learning activities	Assessments	Resources
15	**<u>Sample final exam + Correction</u>**	**1-4**		Ongoing assessment Final exam	
FINAL EXAMINATION					

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Ongoing assessment (30%)	60% Pass	60% Pass		60% Pass
Midterm test (20%)	Part 1 60% Pass	Part 2 60% Pass		
Final exam (50%)	Part 1 60% Pass	Part 2 60% Pass	Part 3 60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Rubrics for Midterm test

Part	Task	CLO
1	Listen to part of a lecture and decide whether these statements are TRUE or FALSE. (40 pts)	**1**
2	Listen to a talk and fill in the summary notes (60 pts)	**2**

5.2. Rubrics for Final exam

Part	Task	CLO
1	Listen to part of a lecture and decide whether these statements are TRUE or FALSE. (30 pts)	**1**
2	Listen to a talk and fill in the summary notes (50 pts)	**2**
3	Write a short paragraph summarizing the main ideas. (20 pts.)	**3**

Evaluative criteria for Part 3

1. **Content accuracy (16 pts):** All statements are accurate and relevant. Summary includes main idea and important details of the given lecture.
2. **Organization & Grammar (4 pts):** The summary is in the form of a paragraph. No/minor punctuation/grammatical/spelling errors.

Revised date: June 5th, 2025

Ho Chi Minh City, June 6th, 2025
Vice Dean of School of Languages
(Signature)

Dr. Vu Hoa Ngan

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Languages

COURSE SYLLABUS

Course Name: Writing AE2

Course Code: **EN011IU**

1. General information

Course name	- *(in English)* **WRITING AE2 (Research Paper Writing)** - *(in Vietnamese) Viết AE2 (Viết bài nghiên cứu)*
Course designation	*This course introduces basic concepts in research paper writing, especially the role of generalizations, definitions, classifications, and the structure of a research paper to students who attend English- medium college or university. It also provides them with methods of developing and presenting an argument, a comparison or a contrast.*
Semester(s) in which the course is taught	1, 2, 3
Person responsible for the course	Lecturers of School of Languages
Language	English
Relation to curriculum	☑ **Compulsory** ☐ Elective
Teaching methods	Lectures, lesson Individual practice Discussion Pair work Group work Project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (lecture, exercise): 30 Private study including examination preparation, specified in hours[1]: 60
Credit points	2 credits (Theory: 2 + Practice: 0) 3.08 ECTS *(optional)*

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Previous course: Writing AE1 (EN007IU)</td></tr>
<tr><td>Course objectives</td><td>Students are required to work on the tasks selected to maximize their exposure to written communication and are expected to become competent writers in the particular genre: the research paper.
As writing is part of an integrated skill of reading and writing where reading serves as input to trigger writing, this course is designed to familiarize non-native students with academic literature in their major study by having them read and critically respond to texts of a variety of topics ranging from natural sciences such as biology to social sciences and humanities like education, linguistics and psychology.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course, students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1. Apply knowledge about conceptual categories-classifications, the structure of a research paper and appropriate academic language in writing a research paper</td></tr>
<tr><td>Skill</td><td>CLO2: Perform skills and strategies for reading critically, analyzing, and annotating academic texts in written summary
CLO3. Demonstrate research writing skills to present an argument, a comparison, or a contrast in their academic study.</td></tr>
<tr><td>Attitude</td><td>CLO4. Display discipline, responsibilities, and ethical practices as an individual and a team member in attending class regularly and actively participating in class activities</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (2 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Unit 1: The Academic Writing Process Introduction</td><td>4</td><td>I, T, U</td></tr>
<tr><td>Unit 2: Researching and Writing</td><td>2</td><td>T, U</td></tr>
<tr><td>Unit 3: Fundamentals & Feedback</td><td>2</td><td>T, U</td></tr>
<tr><td>Unit 4: Definitions, Vocabulary & Clarity</td><td>2</td><td>T, U</td></tr>
<tr><td>Unit 5: Generalizations, Facts and Honesty</td><td>4</td><td>T, U</td></tr>
<tr><td>Unit 6: Seeing Ideas and Sharing Texts</td><td>2</td><td>T, U</td></tr>
<tr><td>Unit 7: Description, Methods & Reality</td><td>2</td><td>T, U</td></tr>
<tr><td>Unit 8: Results, Discussion & Relevance</td><td>2</td><td>T, U</td></tr>
<tr><td>Unit 9: The Whole Academic Text</td><td>2</td><td>T, U</td></tr>
<tr><td>Unit 10: Creating the Whole Text</td><td>4</td><td>T, U</td></tr>
<tr><td>Course Review</td><td>2</td><td>U</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Open-ended questions; Essay writing</td></tr>
</table>

Study and examination requirements	*Attendance* Regular on-time attendance in this course is expected. A student will be allowed no more than three absences. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination. *Assignment (Literature review)* Purpose: Students will use the knowledge of paraphrasing, summarising, developing arguments, andAPA styles to write a 1,000-word literature review on a research scope of their choice. Task: – Follow guidelines on how to write a literature review. – Use relevant academic writing skills such as paraphrasing, summarising, developing arguments,and APA 7th Style Guidelines – see https://www.apastyle.org/ – Develop arguments in relation to the research scope and identify the research gap **Notes:** All papers should be typed, double-spaced, in 13-pt font, and with 1-inch margins. All papersmust be original for this class. Criterion-referenced grading is used in this course. *Missed Tests* Students are not allowed to miss any of the tests (both Mid-term and Final). There are very fewexceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may re-take the examination. *Class Behaviors* Students are required to treat their studying in college as a full-time job and spend an adequate amount of time for this Writing AE2 course with approximately 8-10 hours per week (both in class and self- study). Accordingly, students are supposed to follow the obligations below: - Prepare thoroughly for each class in accordance with the course syllabus and complete homeassignments as the instructor's request. - Participate fully and constructively in all course activities and discussions (if any). - Display appropriate courtesy to all involved in the class. - Provide constructive feedback to faculty members regarding their performance. *Plagiarism* All forms of plagiarism and unauthorised collusion are seriously regarded and could result in penalties. Plagiarism occurs when students copy or reproduce people's words or ideas and then present them as students' own work without proper acknowledgement, including when students copy the work of their fellow students. Plagiarism in student submissions can be detected by: · some web-based programs such as SafeAssign or Turnitin, or · examiner's judgments with evidence of originals

<table>
<tr><td></td><td>The rater will review the paper to check if citations or references are provided properly. Penalties dueto improper citations or references include:
<table>
<tr><th>Degree of magnitude</th><th>Description</th></tr>
<tr><td>Below 15%</td><td>Marked as it is.</td></tr>
<tr><td>15% - 25%</td><td>The score is deducted by 25%.</td></tr>
<tr><td>25% - 40%</td><td>The score is deducted by 50%</td></tr>
<tr><td>Over 40%</td><td>The score is 0.</td></tr>
</table>
Notes: Part of the test is marked as it is if no plagiarism is detected. Students who plagiarize over 40%twice will be prohibited from sitting the final examination.

Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
<tr><td>Reading list</td><td>[1] Hamp-Lyons, L., & Heasley, B. (2006). Study Writing. Cambridge, UK: Cambridge University Press
[2] Articles and Essays taken from The Allyn and Bacon Guide to Writing by Ramage et al (2009),Pearson Longman.
[3] Cormack, J. & Slaught, J. (2009). English for academic study: Extended writing and research skills.Cambridge: Cambridge University Press. Garnet Education
[4] Folse, K. S. & Pugh, T. (2010). Great writing 5: Greater essays. Boston: Heinle, Cengage Learning.
[5] Keezer, S. (Ed.) (2003). Write your research report: A real-time guide. New Jersey: PearsonLearning Group.
[6] Kumar, R. (2019). Research methodology: A step-by-step guide for beginners. Sage Publications</td></tr>
</table>

2. Learning Outcomes Matrix (optional)

3. Planned learning activities and teaching methods

Week	Topic	CLO	Learning activities	Assessments	Resources
1	**Orientation of the Course** **<u>Unit 1:</u> The Academic Writing Process** **Introduction** Thinking about writing processes Distinguishing between academic and personal styles of writingGrammar of academic discourse	**1, 3**	Lecture Group work Individual task	Ongoing assessment & Midterm test	[1] pp. 15-22

Week	Topic	CLO	Learning activities	Assessments	Resources
2	**<u>Unit 2:</u> Researching and Writing** Recognizing categories and classification The language of classification The structure of a research paper	**1, 3**	Lecture Group work Individual task	Ongoing assessment & Midterm test	[1] pp. 25-31
3	**<u>Unit 3:</u> Fundamentals & Feedback** Exploring comparison and contrast structures The language of comparison and contrast Using comparisons and contrasts to evaluate and recommend	**1, 3**	Lecture Group work Individual task	Ongoing assessment & Midterm test	[1] pp. 35-44
4	**<u>Unit 3:</u> Fundamentals & Feedback (Cont.)** The research paper Identifying a research gap The writing process	**1, 3**	Lecture Group work Individual task	Ongoing assessment & Midterm test	[1] pp. 45-49
5	**<u>Unit 4:</u> Definitions, Vocabulary & Clarity** The clarity principle The language of definition The place of definition in academic text The writing process	**1, 2, 3**	Lecture Group work Individual task	Ongoing assessment & Midterm test	[1] pp. 50-59
6	**<u>Unit 5:</u> Generalizations, Facts and Honesty** Honesty principle The language of generalization	**1, 2, 3**	Lecture Group work Individual task	Ongoing assessment & Midterm test	[1] pp. 60-68
7	**<u>Unit 5:</u> Generalizations, Facts and Honesty (Cont.)** Writing a literature review The writing process Brainstorming and clustering APA 7th Style Guidelines – see <u>https://www.apastyle.org/</u> Sample midterm exam + Correction	**1, 2, 3**		Ongoing assessment & Midterm test	[1] pp. 69-74
8	**MIDTERM TEST**				
9	**<u>Unit 6:</u> Seeing Ideas and Sharing Texts** Writing about events in time Connecting events Reading and writing about visuals	**1, 3**	Lecture Group work Individual task	Ongoing assessment & Final exam	[1] pp. 75-88

Week	Topic	CLO	Learning activities	Assessments	Resources
	Learning about peer reviews				
10	**<u>Unit 7:</u> Description, Methods & Reality** Describing processes and products The language for writing about processes Writing the Methods section Giving and getting formal peer feedback	**1, 3**	Lecture Group work Individual task	Ongoing assessment & Final exam	[1] pp. 89-103
11	**<u>Unit 8:</u> Results, Discussion & Relevance** What is an argument? The language of argument The Results and Discussion sections Finding an academic voice	**1, 3**	Lecture Group work Individual task	Ongoing assessment & Final exam	[1] pp. 104-118
12	**<u>Unit 9:</u> The Whole Academic Text** S-P-S-E: Focus on structureS-P-S-E in the introduction The language of coherence and connection Teacher evaluation	**1, 2, 3**	Lecture Group work Individual task	Ongoing assessment & Final exam	[1] pp. 119-133
13	**<u>Unit 10:</u> Creating the Whole Text** Structure of the research paper Creating your own research	**1, 2, 3**	Lecture Group work Individual task	Ongoing assessment & Final exam	[1] pp. 134-139
14	**<u>Unit 10:</u> Creating the Whole Text** Plagiarism Creating citations Paraphrase and summary Authorial identity	**1-4**	Lecture Group work Individual task	Ongoing assessment & Final exam	[1] pp. 140-148
15	**<u>Sample final exam + Correction</u>**	**1-4**		Ongoing assessment & Final exam	
FINAL EXAMINATION					

4. **Assessment plan**

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Ongoing assessment (30%)	60% Pass	60% Pass	60% Pass	60% Pass
Midterm test (20%)	Part 1 60% Pass		Part 2 60% Pass	
Final exam (50%)		Part 1 60% Pass	Part 2 60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. **Rubrics (optional)**

5.1. Rubrics for Midterm test

Part 1: (30 pts) Read a given text and create a graphic display or an outline that categorises the two-level classifications made in the text. (CLO1)

Part 2: (70 pts) Write a comparison/ contrast essay of about 350 words on ONE of the given topics. Pay attention to the use of academic language and a clear text structure.

Content	All main points relevant to the topic The essay question fully answers	**20**	**CLO 3**
Organization	Topic and purpose of the essay discussed in the introduction Each main point discussed in a paragraph All main points summarized and rephrased in the conclusion	**20**	**CLO 3**
Coherence	Paragraphs are ordered in a systematic manner based on, for example, importance, priority, etc. Compare/contrast transitions are properly used.	**15**	**CLO 3**
Style and Tone	Formal writing with full forms Polite writing Academic vocabulary	**15**	**CLO 3**

5.2. Rubrics for Final Exam

Part 1: (30 pts) Write a summary of a given text.

CATEGORIES	**CRITERIA**	**POINTS**	**CLO**
Accuracy and completeness of the content (10 pts)	– The summary contains all of the key ideas in the original, reflecting complete and accurate information about the source.	10	CLO2
Paraphrasing (10 pts)	– All sentences should reveal students' ability in varying the language to avoid repetition.	10	CLO2
Organization (5 pts)	– The summary starts with a general evaluation and includes several sub-topics that explain key ideas from the original. – The summary is organized and coherent.	3 2	CLO2

Grammar, usage and mechanics (5 pts)	– All sentences are clear, accurate and complete. – The summary contains one or two minor errors, but these do not obscure the meaning.	3 2	CLO2
	Total	**30**	

Part 2: (70 pts) Write an argumentative essay of about 350 words on ONE of the given topics. Pay attention to the use of academic language and a clear text structure.

Content	All main points relevant to the topic The essay question fully answers	**20**	**CLO 3**
Organization	Topic and purpose of the essay discussed in the introduction Each main point discussed in a paragraph All main points summarized and rephrased in the conclusion	**20**	**CLO 3**
Coherence	Paragraphs are ordered in a systematic manner based on, for example, importance, priority, etc. Compare/contrast transitions are properly used.	**15**	**CLO 3**
Style and Tone	Formal writing with full forms Polite writing Academic vocabulary	**15**	**CLO 3**

Date revised: 2 June, 2025

Ho Chi Minh City, 6 June, 2025
Vice Dean of School of Languages
(Signature)

Dr. Vũ Hoa Ngân

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Languages

COURSE SYLLABUS

Course Name: Speaking AE2

Course Code: **EN012IU**

1. General information

Course name	- *(in English)* **SPEAKING AE2 (Effective Presentations)** - *(in Vietnamese) Nói AE2 (Bài thuyết trình hiệu quả)*
Course designation	*Giving presentations today becomes a vital skill for students to succeed not only in university but also at work in the future. Speaking AE2, therefore, provides students with the knowledge and skills needed to deliver effective presentations (informative and persuasive presentations).*
Semester(s) in which the course is taught	1, 2, 3
Person responsible for the course	Lecturers of School of Languages
Language	English
Relation to curriculum	☒ **Compulsory** ☐ Elective
Teaching methods	Lecture, lesson, mini presentations
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (lecture, exercise): 30 Private study including examination preparation, specified in hours[1]: 60
Credit points	2 credits (Theory: 2 + Practice: 0) 3.08 ECTS *(optional)*
Required and recommended prerequisites for joining the course	- Previous courses: None

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	Speaking AE2 aims at introducing many aspects of giving a presentation: building up confidence, preparing and planning, using the appropriate language, applying effective visual aids, applying delivery techniques, dealing with questions and responding, performing body language, and so on.
Course learning outcomes	Upon the successful completion of this course, students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1: Apply effective visual aids in preparing and planning well-organized academic presentations
Skill	CLO2: Use appropriate language for academic presentations CLO3: Perform delivery techniques, body language and other para-linguistic elements in academic presentation CLO4: Demonstrate techniques to handle audience questions
Attitude	CLO5: Display discipline, responsibilities, and ethical practices as an individual and a team member in attending class regularly and actively participating in class activities

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (2 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Orientation & Introduction Needs analysis	2	I, T, U
Building up confidence	2	T, U
The first few minutes	2	T, U
Organizing what you want to say	2	T, U
Summarizing and concluding	2	T, U
Using equipment	2	T, U
Delivery techniques: Putting it all together	2	T, U
Group presentations for the instructor's evaluation and advice	2	U
Introduction to persuasive speeches	2	T, U
Methods of persuasion	2	T, U
Maintaining interest	2	T, U
Dealing with problems and questions	2	T, U
Body language	2	T, U
Individual presentations for the instructor's evaluation and advice	4	U

Examination forms	Oral Presentations
Study and examination requirements	*Attendance* Regular on-time attendance in this course is expected. A student will be allowed no more than three absences. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination. *Missed Tests* Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (e.g. certified paper from doctors), students may re-take the examination. *Class Behaviors* Students are required to treat their studying in college as a full-time job and spend an adequate amount of time for this Speaking AE2 course with approximately 8-10 hours per week (both in class and self-study). Accordingly, students are supposed to follow the obligations below: • Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request. • Participate fully and constructively in all course activities and discussions (if any). • Display appropriate courtesy to all involved in the class. • Provide constructive feedback to faculty members regarding their performance. *Plagiarism* Students are warned not to copy from other books or from their peers for all assessment tasks. Committing plagiarism will result in 0 point for the task. Students who plagiarize twice will be prohibited from sitting the final examination. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	[1] Lowe, S, & Pile, L. (2011). *Presenting.* Singapore*:* Cengage Learning [2] Comfort, J. (1996). *Effective presentations*. Oxford: Oxford University Press [3] Lucas, S. (2019). *The art of public speaking* (13th ed.). New York: McGraw-Hill Education. [4] Suzy Siddons. (2008). *The Complete Presentation Skills Handbook, U.S. U.K.*

2. Learning Outcomes Matrix (optional)

3. Planned learning activities and teaching methods

Week	Topic	CLO	Learning activities	Assessments	Resources
1	1. Orientation & Introduction 2. Needs analysis 3. Instructions for video making of self-introduction	1, 5	Lecture	Ongoing assessment Midterm test	[1] Presenting, p. 5 [3]* The Art of Public Speaking, Chapter 6 + videos of introductory speeches
2	Introduction to informative speeches Unit 1: The first few minutes	1, 2, 5	Lecture, Group work	Ongoing assessment Midterm test	[1] Presenting, pp. 8-13 [2] Effective Presentations: p.7 + video clip; p.13+ video clip [3] The Art of Public Speaking, Chapter 10 [3]* The Art of Public Speaking, Chapter 15
3	Unit 3: Organizing what you want to say	1, 2, 5	Lecture, Group work	Ongoing assessment Midterm test	[1] Presenting, pp. 22-27) [2] Effective Presentations: p.19 + video clip [3]* The Art of Public Speaking, Chapters 8+9
4	Unit 6: Summarizing and concluding	1, 2, 3, 5	Lecture, Group work	Ongoing assessment Midterm test	[1] Presenting, pp. 40-45 [2] Effective Presentations: p.41 + video clip [3]* The Art of Public Speaking, Chapters 10
5	Unit 2: Using equipment	1, 2, 3, 5	Lecture	Ongoing assessment Midterm test	[1] Presenting, pp. 14-21) [2] Effective Presentations: p.31 + video clip [3]* The Art of Public Speaking, Chapters 14
6	Delivery techniques: Putting it all together	1, 2, 3, 5	Lecture, Group work	Ongoing assessment Midterm test	[2] Effective Presentations: p.50 + video clip Assignment: Topic(s) for group presentation) [3]* The Art of Public Speaking, Chapters 13

Week	Topic	CLO	Learning activities	Assessments	Resources
7	Group practice **or** reserved week for midterm exam (big class)	1, 2, 3, 5	Group work Individual work	Ongoing assessment Midterm test	
8 + 9	**MIDTERM TEST: Individual informative presentation (4-6 minutes)**				
10	Introduction to persuasive speeches	1, 5	Lecture, Group work	Ongoing assessment Final exam	[3] The art of public speaking, Chapter 15 (Handout given by the instructor)
11	Methods of persuasion	1, 2, 3, 5	Lecture, Group work	Ongoing assessment Final exam	[3] The art of public speaking, Chapter 16 (Handout given by the instructor)
12	Unit 4: Maintaining interest	1, 2, 3, 5	Lecture, Group work	Ongoing assessment Final exam	[1] Presenting: pp. 28-33) [2] Effective Presentations: p.25 + video clip)
13	Unit 5: Dealing with problems and questions	4, 5	Lecture, Group work	Ongoing assessment Final exam	[1] Presenting: pp. 34-39) [2] Effective Presentations: p.44 (Question time) [3]* The Art of Public Speaking, Chapters 13
14	Unit 6: Body language	3, 5	Lecture, Group work	Ongoing assessment Final exam	[2] Effective Presentations: pp.36-39 [3]* The Art of Public Speaking, Chapters 13
15	Practice Wrap-up	1-5	Group work	Ongoing assessment Final exam	
	FINAL EXAM: Individual persuasive presentation (6-8 minutes)				

4. **Assessment plan**

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Ongoing assessment (30%)	60% Pass	60% Pass	60% Pass	60% Pass	60% Pass
Midterm test (20%)	Criteria 4-7 60% Pass	Criteria 1-2 60% Pass	Criterion 3 60% Pass		
Final exam (50%)	Criteria 4-6 60% Pass	Criteria 1-2 60% Pass	Criterion 3 60% Pass	Criterion 4 60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics

5.1. Rubrics for Midterm test

No	Criteria	CLO
1	Pronunciation & Voice Techniques (Pause, Volume, Speed Change, Stress, Tone, etc.) (15 pts)	2
2	Language use: Grammar & Vocabulary (usage and appropriateness for audience) (15 pts)	2
3	Body Language: Gestures, Eye contact, Facial expressions, Appearance (10 pts)	3
4	Organization: Intro, Body, Ending, Coherence (20 pts)	1
5	Content: Relevance, Accuracy (20 pts)	1
6	Visual aids: Appropriateness, Clarity (10 pts)	1
7	Overall effectiveness (10 pts)	1

5.2. Rubrics for Final exam

No	Criteria	CLO
1	Pronunciation & Voice Techniques (Pause, Volume, Speed Change, Stress, Tone, etc.) (15 pts)	2
2	Language use: Grammar & Vocabulary (usage and appropriateness for audience) (10 pts)	2
3	Body Language: Appearance, Posture, Gestures, Eye contact, Facial expression (15 pts)	3
4	Organization: Intro, Body, Ending, Coherence (15 pts)	1
5	Content: Relevant, Accurate, Informative and Persuasive (20 pts)	1
6	Visual aids: Appropriateness, Clarity (15 pts)	1
7	Question response (10 pts)	4

Revised date: June 2nd, 2025

Ho Chi Minh City, June 6, 2025

Vice Dean of School of Languages

Dr. Vũ Hoa Ngân

Calculus 1

1. General Information

a. Course name

- Vietnamese: Toán 1
- English: Calculus 1

b. Course number:

MA001IU

c. Course type:

General

d. Number of credits : 4

- Lecture: 4
- Laboratory: 0

2. Text book, title, author, and year

[1] J. Stewart, Calculus. Concepts and Contexts, 5th ed., Thomson Learning, 2005.

a. other supplemental materials

[1] J. Rogawski, Calculus, Early Transcendentals 3rd edition, W.H. Freeman, 2015.

[2] R.N. Greenwell, N.P. Ritchey, and M.L. Lial, Calculus with Applications for the Life Sciences, Addition Wesley, 2003.

3. Specific course information

a. brief description of the content of the course (catalog description)

- To provide the students with the main ideas and techniques of calculus, concerning limits, continuity, differentiation and integration.
- To provide an understanding of the practical meaning, significance and applications of these ideas and techniques, through practical examples taken from many areas of engineering, business and the life sciences
- To develop skills in mathematical modelling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations
- To develop confidence and fluency in discussing mathematics in English.

b. prerequisites or co-requisites

None

c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

This is a required course.

4. Specific goals for the course

a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.

Upon the successful completion of this course students will be able to:

1. Understanding of the practical meaning, significance and applications of these ideas and techniques, through practical examples taken from many areas of engineering, business and the life sciences Explain the role of a Data Science Process in data analytics.

2. Develop skills in mathematical modelling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations
3. Develop confidence and fluency in discussing mathematics in English

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1	x					
2	x					
3			x			

5. Brief list of topics to be covered

- Functions
- Limits
- Continuity
- Derivatives
- Differentiation
- Derivatives of Basic Elementary Functions
- Differentiation Rules
- Applications of Differentiation: l'Hôpital's Rule
- Optimization
- Newton's Method
- Anti-derivatives
- Indefinite Integrals
- Definite Integrals
- Fundamental Theorem of Calculus
- Techniques of Integration
- Improper Integrals
- Applications of Integration

6. Assessment plan

Assessment item	**LO1**	**LO2**	**LO3**
In-class exercises/quizzes (10%)	x	x	
Lab exercises (20%)			x

Midterm exam (30%)	x		
Final exam (40%)		x	x

LOi: Learning Outcomes (or Course Outcomes)

7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

8. Course Coordinator/Lecturer

- School/Department: Department of Mathematics
- Course Coordinator/Lecturer: Dr.Nguyen Ngoc Hai
- Email: nnhai@hcmiu.edu.vn

Vice Head of Department of Mathematics	Dean of School of Industrial Engineering and Management
Tran Vinh Linh	

Calculus 2

1. General Information

a. Course name

- Vietnamese: Toán 2
- English: Calculus 2

b. Course number:

MA003IU

c. Course type:

General

d. Number of credits : 4

- Lecture: 4
- Laboratory: 0

2. Text book, title, author, and year

[1] J. Stewart, Calculus. Concepts and Contexts, 5th ed., Thomson Learning, 2005.

a. other supplemental materials

[1] J. Rogawski, Calculus, Early Transcendentals 3rd edition, W.H. Freeman, 2015.

[2] R.N. Greenwell, N.P. Ritchey, and M.L. Lial, Calculus with Applications for the Life Sciences, Addition Wesley, 2003.

3. Specific course information

a. brief description of the content of the course (catalog description)

To provide the students with the main notions and techniques of calculus of functions of several variables concerning limits, continuity, differentiation and integration; basic skills of computing the sum of series. Many applications explain how to use these notions and techniques in practical situations.

b. prerequisites or co-requisites Calculus 1

c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

This is a required course.

4. Specific goals for the course

a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.

Upon the successful completion of this course students will be able to:

1. Understanding of the practical meaning, significance and applications of these ideas and techniques, through practical examples taken from many areas of engineering, business and the life sciences Explain the role of a Data Science Process in data analytics.
2. Develop skills in mathematical modelling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations
3. Develop confidence and fluency in discussing mathematics in English

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1	x					
2	x					
3			x			

5. Brief list of topics to be covered

- Sequence and Series
- Convergence Tests
- Power Series
- Taylor and Maclaurin Series
- Cartesian Coordinates
- Lines, Planes and Surfaces
- Derivatives and Integrals of Vector Functions
- Arc Length and Curvature
- Parametric Surfaces
- Functions of Several Variables
- Limits, Continuity, Partial Derivatives, Tangent Planes
- Gradient Vectors; Extrema
- Lagrange Multiplier
- Multiple Integrals: Double Integrals, Triple Integrals, Techniques of Integration
- Vector Fields, Line Integrals, Surface Integrals.

6. Assessment plan

Assessment item	**LO1**	**LO2**	**LO3**
In-class exercises/quizzes (10%)	x	x	
Lab exercises (20%)			x
Midterm exam (30%)	x		
Final exam (40%)		x	x

LOi: Learning Outcomes (or Course Outcomes)

7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

8. Course Coordinator/Lecturer

- School/Department: Department of Mathematics
- Course Coordinator/Lecturer: Dr.Mai Duc Thanh
- Email: mdthanh@hcmiu.edu.vn

Vice Head of Department of Mathematics	Dean of School of Industrial Engineering and Management
Tran Vinh Linh	

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
Department of Physics

COURSE SYLLABUS

Course Name: Physics 1 (General Mechanics)

Course Code: **PH013IU**

1. General information

Course designation	*This subject will provide an introduction to mechanics including: concepts and principles of kinetics, dynamics, energetics of motion of a particle and a rigid body.*
Semester(s) in which the course is taught	1, 2
Person responsible for the course	Assos. Prof. Phan Bảo Ngọc Dr. Phan Hiền Vũ
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, assignment.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): lecture: 30 Private study including examination preparation, specified in hours[1]: 60
Credit points	2
Required and recommended prerequisites for joining the course	None

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	This course will provide students with: 1. The basic knowledge of general Mechanics Physics 2. Skills to solve problems in engineering environment by applying both theoretical and experimental techniques 3. Understanding and skills needed to use physical laws governing real process and to solve them in the engineering environment 4. Confidence and fluency in discussing physics in English.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1. Understand basic knowledge of kinematics, dynamics, and laws of conservation of a mechanical system. CLO2. Apply knowledge of physics to solving problems in science and engineering
Skill	CLO3. Apply skills to analyzing and solving problems in science and engineering
Attitude	CLO4. Communicate effectively in writing manner

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (2 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Chapter 1: Bases of Kinematics	2	I, T,U
Chapter 2: The Law of Motion	2	I, T,U
Chapter 3: Work and Mechanical Energy	3	I, T,U
Chapter 4: Linear Momentum and Collisions	2	I, T,U
Chapter 5: Rotation of a Rigid Object About a Fixed Axis	2	I, T,U
Chapter 6: Equilibrium and Elasticity	2	I
Chapter 7: Universal Gravitation	2	I

Examination forms	Short-answer questions
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.

Reading list	[1] Lecture Notes [2] Halliday D., Resnick R. and Walker, J. (2011) *Principles of Physics*, 9th edition, John Willey and Sons, Inc. [3] Alonso M. and Finn E.J. (1992) *Physics,* Addison-Wesley Publishing Company. [4] Faughn/Serway (2006) *Serway's College Physics*, Thomson Brooks/Cole.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Intended Learning Outcomes (ILO) (1-10) is shown in the following table:

	ILO									
CLO	1	2	3	4	5	6	7	8	9	10
1	x									
2	x									
3										
4										

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1-3	**Chapter 1**: Basis of Kinematics Motion in One Dimension: - Position, Velocity, and Acceleration - One-Dimensional Motion with Constant Acceleration - Freely Falling Objects Motion in Two Dimensions: - Position, Velocity, and Acceleration Vectors - Two-Dimensional Motion with Constant Acceleration. Projectile Motion - Circular Motion. Tangential and Radial Acceleration - Relative Velocity and Relative Acceleration	1	Assignment/Quiz Midterm	Lecture, Discussion, Inclass-Quiz	[1] 1 [2] 1, 2, 3, 4
4-7	**Chapter 2**: Laws of Motion - Newton's First Law and Inertial Frames - Newton's Second Law - Newton's Third Law	1	Assignment//Quiz Midterm	Lecture, Discussion, Inclass-Quiz	[1] 2 [2] 5, 6

	Some Applications of Newton's Laws: - Gravitational Force and Weight - Forces of Friction - Uniform Circular Motion and Non-uniform Circular Motion - Motion in the Presence of Resistive Forces - Motion in Accelerated Frames				
8	**Chapter 3**: Work and Mechanical Energy - Work Done by Force. Power - Kinetic Energy and Work. Kinetic Energy Theorem	3	Assignment//Quiz Final	Lecture, Discussion, Inclass-Quiz	[1] 3 [2] 7, 8
	Midterm				
9	- Potential Energy of a System - Conservation of Mechanical Energy - Conservative and Non-conservative Forces - Changes in Mechanical Energy for Non-conservative Forces - Relationship Between Conservative Forces and Potential Energy			Lecture, Discussion, Inclass-Quiz	
10-11	**Chapter 4**: Linear Momentum and Collisions - Linear Momentum and Its Conservation - Impulse and Momentum - Collisions in One Dimension and Two Dimensions		Assignment//Quiz Final	Lecture, Discussion, Inclass-Quiz	[1] 4 [2] 9
12-14	**Chapter 5**: Rotation of a Rigid Object About a Fixed Axis - Rotational Kinematics. Rotational Motion with Constant Angular Acceleration - Torque and Angular Acceleration - Moments of Inertia - Rotational Kinetic Energy - Rolling Motion of a Rigid Object - Angular Momentum of a Rotating Rigid Object - Conservation of Angular Momentum	3	Assignment//Quiz Final	Lecture, Discussion, Inclass-Quiz	[1] 5 [2] 10, 11
15	**Chapter 6**: Equilibrium and Elasticity The Conditions for Equilibrium The Center of Gravity **Chapter 7**: Universal Gravitation Newton's Law of Gravitation Kepler's Laws and the Motion of Planets The Gravitational Field and Gravitational and Potential Energy	3	Assignment//Quiz Final	Lecture, Discussion, Inclass-Quiz	[1] 6, 7 [2] 12. 13
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes (10%)	Qz1 60%Pass	Qz2 60%Pass		Qz3 60%Pass
Homework exercises (20%)	HW2 50%Pass		HW1, HW3, HW4 50%Pass	
Midterm exam (30%)		Q3 50%Pass	Q1, Q2 50%Pass	
Final exam (40%)	Part I 50%Pass		Part II.1,2 50%Pass	Part II.3 50%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. Date: …… Evaluator: ……			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
Presentation (20%)			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.

3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: December 27, 2022

Ho Chi Minh City, 27/12/2022

Chair of Department of Physics

Phan Bảo Ngọc

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
Department of Physics

COURSE SYLLABUS

Course Name: Physics 2 (Fluid Mechanics and Thermal Physics)

Course Code: **PH014IU**

1. General information

Course designation	*This subject will provide a basic knowledge of fluid mechanics; macroscopic description of gases; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gases and the kinetic theory of gases.*
Semester(s) in which the course is taught	1, 2
Person responsible for the course	Assos. Prof. Phan Bảo Ngọc Dr. Phan Hiền Vũ
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, assignment.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): lecture: 30 Private study including examination preparation, specified in hours[1]: 60
Credit points	2
Required and recommended prerequisites for joining the course	None

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Course objectives</td><td>This course will provide students with:
1. The basic knowledge of Fluid Mechanics and Thermal Physics
2. Skills to solve problems in engineering environment by applying both theoretical and experimental techniques
3. Understanding and skills needed to use physical laws governing real process and to solve them in the engineering environment
4. Confidence and fluency in discussing physics in English.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1. Understand basic knowledge of fluid mechanics, laws of thermodynamics, and the kinetic theory of an ideal gas.
CLO2. Apply knowledge of physics to solving problems in science and engineering</td></tr>
<tr><td>Skill</td><td>CLO3. Apply skills to analyzing and solving problems in science and engineering</td></tr>
<tr><td>Attitude</td><td>CLO4. Communicate effectively in writing manner</td></tr>
</table></td></tr>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (2 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Chapter 1: Fluid Mechanics</td><td>2</td><td>I, T,U</td></tr>
<tr><td>Chapter 2: Temperature, Heat, and the First Law of Thermodynamics</td><td>4</td><td>I, T,U</td></tr>
<tr><td>Chapter 3: The Kinetic Theory of Gases</td><td>5</td><td>I, T,U</td></tr>
<tr><td>Chapter 4: Entropy and the Second Law of Thermodynamics</td><td>4</td><td>I, T,U</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Short-answer questions</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
</table>

Reading list	[1] Lecture Notes [2] Halliday D., Resnick R. and Walker, J. (2011) *Principles of Physics*, 9th edition, John Willey and Sons, Inc. [3] Alonso M. and Finn E.J. (1992) *Physics,* Addison-Wesley Publishing Company. [4] Faughn/Serway (2006) *Serway's College Physics*, Thomson Brooks/Cole.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Intended Learning Outcomes (ILO) (1-10) is shown in the following table:

	ILO									
CLO	1	2	3	4	5	6	7	8	9	10
1	x									
2	x									
3										
4										

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1-2	**Chapter 1**: Fluid Mechanics - Fluids at Rest - Ideal Fluids in Motion - Bernoulli's Equation	1, 2	Assignment//Quiz Midterm	Lecture, Discussion, Inclass-Quiz	[1] 1 [2] 14
3-8	**Chapter 2**: Temperature, Heat, and First Law of Thermodynamics - Temperature and Zeroth Law of Thermodynamics - Thermal Expansion - Heat and Absorption of Heat by Solids and Liquids - Work and Heat in Thermodynamic Processes - First Law of Thermodynamics and Its Some Special Cases - Heat Transfer Mechanisms	1, 2	Assignment//Quiz Midterm	Lecture, Discussion, Inclass-Quiz	[1] 2 [2] 18
	Midterm				
9-12	**Chapter 3**: Kinetic Theory of Gases - Ideal Gases: Experimental Laws, Equation of State - Molecular Model of an Ideal Gas. Mean Free Path - Boltzmann Distribution Law and	3, 4	Assignment//Quiz Final	Lecture, Discussion, Inclass-Quiz	[1] 2 [2] 19

	Distribution of Molecular Speeds - Molar Specific Heats of an Ideal Gas - Equipartition of Energy Theorem - Adiabatic Expansion of an Ideal Gas				
13-15	**Chapter 4**: Entropy and Second Law of Thermodynamics - Reversible, Irreversible Processes and Entropy - Second Law of Thermodynamics - Entropy in Real World: Engines - A Statistical View of Entropy	3, 4	Assignment//Quiz Final	Lecture, Discussion, Inclass-Quiz	[1] 4 [2] 20
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes (10%)	Qz1 60%Pass	Qz2 60%Pass		Qz3 60%Pass
Homework exercises (20%)	HW2 50%Pass		HW1, HW3, HW4 50%Pass	
Midterm exam (30%)		Q3 50%Pass	Q1, Q2 50%Pass	
Final exam (40%)	Part I 50%Pass		Part II.1,2 50%Pass	Part II.3 50%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: …….			
Date: …… Evaluator: ……			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
Presentation (20%)			
Correct spelling, grammar, and syntax	10		

Clear and easy to read	10		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: December 27, 2022

Ho Chi Minh City, 27/12/2022
Chair of Department of Physics

Phan Bảo Ngọc

Chemistry for Engineer

1. General Information

a. Course name

- Vietnamese: Hoá học cho kĩ sư
- English: Chemistry for Engineer

b. Course number:

CH011IU

c. Course type:

General

d. Number of credits : 3

- Lecture: 3
- Laboratory: 0

2. Text book, title, author, and year

[1] Chemistry for Engineers – An Applied Approach by Mary Jane Shultz, 2007.
[2] General Chemistry" by Darrell Ebbing and Steven D. Gammon, 9th Ed., 2010.
[3] Chemistry: A Molecular Approach by Nivaldo J. Tro, 2nd Ed., 2008.
[4] Chemistry, Principles and Reactions by Masterton and Hurley, 6th Ed., 2009.

a. other supplemental materials

none

a. brief description- of the content of the course (catalog description)

This one- semester course is designed for engineering students those who -are pursuing a non chemistry engineering degree such as information technology, bio technology, civil, biomedical, electronic and telecommunication engineering. The course will introduce the basic principles of chemistry- and connect those principles to issues in engineering professions. The related lab work is not included in this course.

b. prerequisites or co-requisites

None

c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

This is a required course.**3.Specificcourseinformation**

4. Specific goals for the course

a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.

Upon the successful completion of this course students will be able to:

1. Demonstrate basic knowledge of the following:

- The role of chemistry for engineers
- Measurements in chemistry
- Matter and state of matter
- Structure of atoms, molecules and ions
- Periodicity

- Chemical bonds
- Intermolecular forces, liquid and solid
- Gases, liquids, solids and their properties
- Types and rates of chemical reactions
- Chemical equilibrium
- Electrolytes, acid-base, pH, buffer
- Thermochemistry and thermodynamics
- Electrochemistry

2. Development of their critical thinking and problem-solving skills for applying chemistry in an engineering context
3. Ability to explain many aspects of everyday life using chemistry concepts

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

- Nuclearchemistry

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1	x					
2	x					
3						x

5. Brief list of topics to be covered

- Introduction to General Chemistry for Engineers
- Measurements in Chemistry
- Introduction to Matter
- Atoms, Molecules and Ions
- Periodicity
- Chemical Bonds
- Intermolecular Forces
- Gases and Their Properties
- Solutions and Their Properties
- Solids and Their Properties
- Chemical Reactions
- Chemical Kinetics
- Chemical Equilibrium-
- Electrolytes, Acid Base, pH and Buffer
- Thermochemistry and Thermodynamics
- Electrochemistry
- Nuclear Chemistry

6. Assessment plan

Assessment item	LO1	LO2	LO3
Lab exercises (20%)			x
Midterm exam (30%)	x		

Final exam (50%)		x	x

LOi: Learning Outcomes (or Course Outcomes)

7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

8. Course Coordinator/Lecturer

- School/Department: School of Biotechnology
- Course Coordinator/Lecturer: Dr. Huynh Kim Lam
- Email: hklam@hcmiu.edu.vn

Dean of School of Biotechnology

Nguyễn Văn Thuận

Dean of School of Industrial Engineering and Management

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY

COURSE SYLLABUS

General Law

PE021IU

1. General information

Department	Office of Academic Affairs
Course classification	Foundation course
Course designation	Face to face
Semester(s) in which the course is taught	All semesters in each academic year
Person responsible for the course	Dr. Vo Tuong Huan LLM. Bui Doan Danh Thao
Language	English
Relation to curriculum	Compulsory
Teaching methods	Student-centred approach
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 127.5 hours) Contact hours (lecture, in class discussions): 37.5 hours (=45 periods) Private study including examination preparation, specified in hours[1]: 90 hours
Credit points	3
Required and recommended prerequisites for joining the course	N/A

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Course objectives</td><td>The overarching aims of this course are to:
• Provide essential knowledge of Vietnamese legal system through integrated technology and real cases for social and cultural sustainability.
• Raise awareness of responsibility toward others and how to stand for ending all types of legal violations, especially corruption in various social contexts.
• Practice necessary skills to act as an ambassador to ensure social fairness and global equitable rights.
• Use integrated online legal resources and communication tools to help the community to identify issues and develop countermeasures.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course, students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1. Apply appropriate legal knowledge in the Vietnamese legal system to solve legal issues in various social contexts for a fair sustainable lifelong being.
CLO1.1. Apply general knowledge on state and law to solve legal issues in various social contexts for a fair sustainable lifelong being.
CLO1.2. Apply principle legal norms in some law branches such as constitution, civil, criminal, labor and administrative law to solve legal issues in various social contexts for a fair sustainable lifelong being.</td></tr>
<tr><td>Skill</td><td>CLO2. Communicate knowledge in the Vietnamese legal system to encourage people to raise their legal rights aiming for fair social/cultural moves.
CLO3. Integrate ICTs to solve legal issues in various social contexts.</td></tr>
<tr><td>Attitude</td><td>CLO4. Detect the responsibility to ensure social and cultural fairness, including ending corruption, in various social contexts through understanding importance of law in social contexts.
CLO5. Respond to the base for coexistence in various social contexts.</td></tr>
</table></td></tr>
<tr><td>Content</td><td>The course will introduce students to Vietnamese legal systems. In particular, students will understand their rights and obligations in the Constitution, Criminal law, administrative law, civil law, labor law and enterprise law of Vietnam. From this, students will raise awareness towards their responsibility to ensure justice, including ending corruption, in society.</td></tr>
<tr><td>Examination forms</td><td>Multiple choice questions
Case-based exams
Essay exams
Oral exams</td></tr>
</table>

Study and examination requirements

To pass this course, the students must:

- Achieve a composite mark of at least 50; and
- Make a satisfactory attempt at all assessment tasks (see below).

GRADING POLICY

Grades can be based on the following:

Assignment	20%
Midterm examination	30%
Final examination	50%
Total	100%

COURSE POLICIES

Attendance

Regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty percent of scheduled classes they may be refused final assessment. Exemptions may only be made on eligible medical grounds.

Workload

It is expected that the students will spend at least *six* hours per week studying this course. This time should be made up of reading, research, working on exercises and problems, and attending classes. In periods where they need to complete assignments or prepare for examinations, the workload may be greater.

Over-commitment has been a cause of failure for many students. They should take the required workload into account when planning how to balance study with part-time jobs and other activities.

General Conduct and Behaviour

The students are expected to conduct themselves with consideration and respect for the needs of fellow students and teaching staff. Conduct which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students will be asked to leave the class. The use of laptops is also encouraged during law lessons only to search for materials online. More information on student conduct is available on the university webpage.

Keeping informed

The students should take note of all announcements made in lectures or on the course's Blackboard, and another announced mean of communications. From time to time, the university will send important announcements to their university e-mail addresses without providing a paper copy. The students will be deemed to have received this information.

Academic honesty and plagiarism

Plagiarism is the presentation of the thoughts or work of another as one's own. Students are also reminded that careful time management is an important part of the study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and

	the proper referencing of sources in preparing all assessment items. The university regards plagiarism as a form of academic misconduct and has very strict rules regarding plagiarism. **Special consideration** Requests for special consideration (for final examination only) must be made to the Office of Academic Affairs within one week after the examination. General policy and information on special consideration can be found at the Office of Academic Affairs. Absence on the Mid-term is not allowed, or in special cases approved by Lecturer can be replaced with relevant Assignment. **Meeting up with the lecturers after classes** Students must make an appointment via emails if they want to meet up with the lecturer after classes and be on time. If there are any changes to the scheduled time, students must inform the lecturer immediately.
Reading list	Please note that it is very important to gain familiarity with the subject matter in the readings and cases available on Blackboard and the internet *before* attendance in classes. **Required Course Texts and Materials** Legal Texts: 1. Constitution of Vietnam - 2013 2. Civil Code of Vietnam - 2015 3. Criminal Code of Vietnam – 2015 (amended in 2017) 4. Law on Law on Handling of Administrative Violations 2012 5. Law on Enterprises – 2020 6. Labour Code 2019 7. Law on anti-corruption 2018 Available at https://luatvietnam.vn/ or Blackboard Books: • PGS.TS. Phan Trung Hien, *Giáo trình Pháp Luật Đại cương*, NXB Chính Trị Quốc Gia Sự Thật 2022. • Mai Hong Quy (Chief Editor) (2nd 2017), *Introduction to Vietnamese Law,* Hong Duc Publishing House. Additional materials provided in Blackboard The lecturer will attempt to make lecture notes and additional reading available on Blackboard. However, this is not an automatic entitlement for students doing this subject. Note that this is not a distance learning course, and you are expected to attend lectures and take notes. This way, you will get the added benefit of class interaction and demonstration. **Optional Course Texts and Materials** Recommended Internet sites UNCTAD (United Nations Conference on Trade and Development) WTO (World Trade Organization) MOIT - Vietnam (Official website of Ministry of Industry and Trade) MPI - Vietnam (Official website of Ministry of Planning and Investment)

	Other Resources, Support and Information Additional learning assistance is available for students in this course and will be made available on Blackboard. Academic journal articles are available through connections via the VNU - Central Library. Recommended articles will be duly informed to the students. Books: • Nguyen Phu Trong, *Kiên quyết, kiên trì đấu tranh phòng, chống tham nhũng, tiêu cực, góp phần xây dựng đảng và nhà nước ta ngày càng trong sạch, vững mạnh*, NXB Chính Trị Quốc Gia Sự Thật 2023. • University of Law Ho Chi Minh City, *Giáo trình luật Hiến pháp Việt nam*, NXB Hồng Đức 2023. • University of Law Ho Chi Minh City, *Giáo trình Luật hành chính*, NXB Hồng Đức 2022. • University of Law Ho Chi Minh City, *Giáo trình Luật hình sự Việt Nam*, NXB Hồng Đức 2022. • University of Law Ho Chi Minh City, *Giáo trình Luật dân sự Việt Nam*, NXB Hồng Đức 2022. • University of Law Ho Chi Minh City, *Giáo trình Luật lao động Việt Nam*, NXB Hồng Đức 2022. • University of Law Ho Chi Minh City, *Giáo trình pháp luật về chủ thể kinh doanh*, NXB Hồng Đức 2022.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (SLO) (1-5) and Program/Student Learning Outcomes (PLO/SLO) (1 - 10) is shown in the following table:

	PLO/SLO									
SLO	**1**	2	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	R,M					R,M	R,M	R,M	R,M	R,M
2			R,M							
3			R,M							
4				R,M						
5					R,M					

R: Reinforced
M: Mastery

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	**Introduction to State** • What is State? • Nature of state • Forms of state • Functions of state • Introduction to structure of Vietnamese state	1-5 (level I - introduced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT - Introduction to Vietnamese legal system available on Blackboard

2	**Introduction to law?** • What is law? • Nature of law • Forms of law • Structure of law • Categorization of legal system. • Enforcement • Breach of law and liabilities for breach of law • Introduction to structure of Vietnamese legal system	1-5 (level I - introduced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT - Introduction to Vietnamese legal system available on Blackboard
3	**Constitutional Law** • General introduction on Vietnamese Constitution and its nature and basic principles. • Political, economic and other regimes of Vietnam • Basic rights and responsibilities of citizens. Relationship between citizens and the State. • Structure, functions and duties of Vietnamese state, especially in prevention of corruption	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPTs – Constitutional law available on Blackboard Constitution 2013 available on Blackboard
4	**Constitutional Law (Cont)** • Structure and functions and duties of Vietnamese state • Duties of the state in prevention of corruption	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPTs – Constitutional law available on Blackboard Constitution 2013 available on Blackboard
5	**Administrative Law** • Definition and nature of administrative law • Administrative law violations • Liabilities for breach of administrative law, exemption from the liability	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies and law on anti-corruption	PPT– Administrative law available on Blackboard Law on handling administrative violations 2012, and Law on anti-corruption 2018 available on Blackboard
6	**Criminal Law** • Definition and nature of criminal law	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance	Discussions Case studies, especially cases related	PPT– Criminal law available on Blackboard

	• Crimes • Punishments		evaluations	to corruption	Criminal code 2015 available on Blackboard
7	**Criminal Law (Cont)** • Crimes related to corruption • Punishments for corruption	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies, especially cases related to corruption	PPT– Criminal law available on Blackboard Criminal code 2015 available on Blackboard
8	**Revision for mid-term exam**		Quizzes Projects		
9	**Civil Law (Part I)** • Definition and nature Civil law relationship • Subject of civil law • Property and ownership • Civil transactions	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Civil law available on Blackboard Civil code 2015 available on Blackboard
10	**Civil Law (Part II)** • Contracts - Definitions - Formation of contracts - Validity of contracts - Liability for breach of contracts	1-5 (Level M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Civil law available on Blackboard Civil code 2015 available on Blackboard
11	**Civil Law (Part III)** • Inheritance - Testamentary inheritance - Intestacy	1-5 (Level M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Civil law available on Blackboard Civil code 2015 available on Blackboard
12	**Law on Enterprises** • Introduction to law on enterprises • Introduction to forms, features, establishment, reorganization and dissolution of an enterprise	1-5 (Level I - Introduced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Law on enterprises available on Blackboard Law on enterprises 2020 available on Blackboard
13	**Labor Law** • Definition, and nature of labour law • Employees and employers • Working time, and resting time • Salary (including salary for overtime working hours)	1-5 (Level M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Labor law available on Blackboard Labor code 2019 available on Blackboard
14	**Labour Law** (Cont.)	1-5 (Level M -	Tests Peer evaluations	Discussions Case studies	PPT– Labor law available on

	• Employment contracts • Labor disciplines • Dispute settlements	Mastery)	Class-performance evaluations		Blackboard Labor code 2019 available on Blackboard
15	**Revision/ Tutoring classes**		Quizzes Projects		

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**
In class evaluation (20%)	70% pass	80% pass	100% pass	100% pass	100% pass
Midterm examination (30%)	70% pass	80% pass	100% pass	100% pass	100% pass
Final examination (50%)	70% pass	80% pass	100% pass	100% pass	100% pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics

No.	CLOs	Criteria	COMPLETELY FAIL Below 30%	INADEQUATE 30% – 49%	ADEQUATE 50% - 69%	ABOVE AVERAGE 70% - 89%	EXEMPLARY ≥ 90%
1	CLO 1	**Organisation and clarification**	No evidence of organization and coherence	Does not organise ideas logically and with clarification Limited evidence of coherence Ideas lack consistence	Generally organised logically, with evidence of progression Occasionally, there may be a lack of focus or ideas may be tangential	Clear organization and progression. Responds appropriately and relevantly, although some ideas are underdeveloped	Response is focused, detailed and non-tangential. Shows a high degree of attention to logic and reasoning of points. Clearly leads the reader to the conclusion and stirs thought regarding the topic
2		**Originality and usefulness of the analysis**	Shows no ability to identify legal issues or a clear inability to gather the facts	Demonstrates an incomplete grasp of the task. There is no overall sense of creative coherence. Arguments are addressed incompletely.	Shows ability to identify legal issues, gather the facts and develop claims. Argument are addressed well but no links with evidence	Shows strong ability to identify legal issues, gather the fact and develop claims as well as link claims with evidence. Overall, an acceptable solution is offered and explained	Shows strong ability to identify legal issues, gather the facts and develop claims as well as link claims with evidence. Satisfactory solutions are offered and supported
3		**Use of data/information**	Shows no effort to incorporate information from primary and secondary sources	Shows little information from sources. Poor handling of sources	Shows moderate amount of source information incorporated. Some key points supported by sources. Quotations may be poorly integrated into paragraphs. Some possible problems with source citations	Draws upon sources to support most points. Some evidence may not support arguments or may appear where inappropriate. Quotations integrated well into paragraphs. Sources cited correctly	Draws upon primary and secondary source information in useful and illuminating ways to support key points. Excellent integration of quoted material into paragraphs. Source cited correctly
4	CLO2	**Use of frameworks**	Shows no effort to structure	Shows limited ability to structure	Shows effort to link problems with the theoretical	Shows ability to structure problems in	Shows ability to structure problems in correspondence to

			problems in correspondence to theoretical frameworks	problems in correspondence to theoretical frameworks	frameworks. There are still some mistakes	correspondence to theoretical frameworks correctly. Minor mistakes in resolving problems	theoretical frameworks correctly. The problems are well resolved
5		**Quality of arguments**	Shows no effort to construct logical arguments. Fails to support analysis	Shows little attempt to offer support for key claims or to relate evidence to analysis. Reasons offered are irrelevant.	Shows argument of poor quality. Weak, undeveloped reasons are offered to support key claims	Shows clear, relevant and logical arguments.	Shows identifiable, reasonable and sound arguments. Clear reasons are offered to support key claims.

Ho Chi Minh City, May 2023
Head of Office of Academic Affairs

Huỳnh Khả Tú

SYLLABUS
APPLIED LINEAR ALGEBRA

1. General Information

Course Title	
+ Vietnamese	*Ứng dụng đại số tuyến tính*
+ English	Applied Linear Algebra
Course ID	MA027IU
Course level	☒ Undergrad ☐ Master ☐ Both
Course type	☒ General ☐ Fundamental ☐ Specialization (required) ☐ Specialization (elective) ☐ Project/Internship/Thesis ☐ Others: ……
Number of credits	**2**
+ Lecture	2
+ Laboratory	Nil
Prerequisites	Calculus 1
Parallel Course	Nil
Course it replaces	
Course standing in curriculum	Year 2 ISE undergraduate program (see curriculum mapping in student handbook)

2. Course Description

- Systems of linear equations, Matrices in echelon form, Gauss elimination method, Algebra of matrices, Determinants and their properties, Vector Spaces, Linear independence, Basis, Rank of a matrix, Linear transformation, Inner product spaces, Eigenvalues and Eigenvectors.

3. Textbooks and references

Textbooks:

R.O. Hill, Elementary linear algebra with applications, 3rd edition, Thomson, 2006.

E. Kreyszig, Advanced Engineering Mathematics, 9th edition, John Wiley & Sons, 2006

Reference Materials:

4. Course Objectives

- To provide the students with the main ideas of the basic theory of linear equation and matrix
- To study applications of algebra matrixes and linear equation through practical examples taken from many areas of engineering, business, social sciences, etc.
- To develop the ability to construct and analyze mathematical models based on algebra matrixes and linear equation.

5. Learning Outcomes

Learning outcome codes	Course learning outcome descriptions	Program Learning outcomes after ABET
G1	To provide the main ideas and techniques of calculus, concerning linear equations, Matrices in echelon form, their properties.	(a)
G2	To provide an understanding of the practical meaning, significance and applications of these ideas and techniques, through practical examples taken from many areas of engineering, business and the life science.	(a)
G3	To develop skills in mathematical modelling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations	(a), (e), (k)
G4	To develop confidence and fluency in discussing mathematics in English.	(g), (i)

(*) Refer to ABET student outcomes

(a) an ability to apply knowledge of mathematics, science, and engineering

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to function on multidisciplinary teams

(e) an ability to identify, formulate, and solve engineering problems

(f) an understanding of professional and ethical responsibility

(g) an ability to communicate effectively

(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

(i) a recognition of the need for, and an ability to engage in life-long learning

(j) a knowledge of contemporary issues

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

6. Course Assessment

Assessment component	Assessment form	Percentage %
Lecture		
A1. Process assessment	A1.1 Quiz	10%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Mid-term Exam	20%
A3. Final assessment	A3.1 Final exam	60%

7. Course Outline

Week/ Class	Content	Learning outcomes	Teaching and learning activities	Assessment
1	**Chapter 1. Introduction to linear equations and matrices** 1.1. Gauss elimination 1.2. The algebra of matrices	G1, G2, G3	in class	A1.1 A1.2
2&3	**Chapter 1. Introduction to linear equations and matrices (cont)** 1.3. Invese mattices 1.4. Transpose-symmetric matrices	G1, G2, G3		

4&5	**Chapter 2. Determinants** 2.1 The Determinant of a Matrix 2.2 Evaluation of a Determinant using Elementary Operations	G1, G2, G3	in class	A1.1 A1.2
6&7	**Chapter 2. Determinants (cont)** 2.1 The Determinant of a Matrix 2.2 Evaluation of a Determinant using Elementary Operations	G1, G2, G3	in class	A1.1 A1.2
8	Review		in class	A1.1 A1.2
	Midterm exam			A2.1
9	**Chapter 3. Vector spaces** 3.1 Euclidean n-spaces 3.2 General vector spaces	G1, G2, G3	in class	A1.1 A1.2
10	**Chapter 3. Vector spaces (cont)** 3.3 Subspaces, span, null spaces 3.4 Linear independence			
11	**Chapter 3. Vector spaces (cont)** 3.5 Basis and Dimension 3.6 Rank of a matrix			
12	**Chapter 4. Linear Transformation, Inner product spaces, Eigenvalues and eigenvectors** 4.1 Linear transformation 4.2 Inner product spaces	G1, G2, G3	in class	A1.1 A1.2
13	**Chapter 4. Linear Transformation, Inner product spaces, Eigenvalues and eigenvectors (cont)** 4.3 Eigenvalues and eigenvectors 4.4 Diagonalization	G1, G2, G3	in class	A1.1 A1.2
14	Review	G1, G2, G3	in class	A1.1 A1.2
14	Review	G1, G2, G3	in class	A1.1 A1.2
	Final exam			A3.2

8. Course Policy

Class Participation: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

9. Course Coordinator/Lecturer

- Department of Industrial & Systems Engineering, Room: O2-602
- Course Coordinator/Lecturer: Mathematics Department
- Email:

Vice Head of Department of Mathematics	Dean of School of Industrial Engineering and Management
Tran Vinh Linh	

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: ENGINEERING PROBABILITY & STATISTICS

Course Code: **IS112IU**

1. General information

Course designation	
Semester(s) in which the course is taught	2
Person responsible for the course	*Dr. Phan Nguyen Ky Phuc*
Language	English
Relation to curriculum	*Compulsory*
Teaching methods	*Lecture, lesson, project*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload:* *Contact hours (please specify whether lecture, exercise, laboratory session, etc.):* *Private study including examination preparation, specified in hours*[1]*:*
Credit points	4 (3 theory credits + 1 lab credit)

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td></td></tr>
<tr><td>Course objectives</td><td>On completion of this course, the student will be able to develop probability problems in engineering, conditional probability, discrete and continuous distributions, sampling distribution, interval estimates, hypothesis testing, analysis ofvariance, regression models and non-parametric testing.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><td>Competency level</td><td>Course learning outcome (CLO)</td></tr>
<tr><td>Knowledge</td><td>CLO1. Students are able to master the basic knowledge of calculating histogram, percentile and basic statistics index
CLO2. Students are able to master the basic knowledge of formulating the conditional probability, discrete, continuous random variable problem
CLO3. Students are able to use different methods to solve engineering tasks such as setup the proper hypothesis testing, ANOVA, linear regression</td></tr>
<tr><td>Skill</td><td>CLO4. Students are able to apply their knowledge and develop practical skills for solving problems, conducting experiments and developing equipment and processes of engineering by using EXCEL software</td></tr>
</table></td></tr>
</table>

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (4 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	Weight	Level
Introduction to Probability and Statistics	**1**	**I, T**
Random variables & Condition Probability	**2**	**I, T**
Discrete Random Variables	**2**	**I, T**
Continuous Random Variables	**2**	**I, T**
Sampling and Central Limit Theorems	**1**	**I, T**
One Population Hypothesis Testing	**2**	**I, T**
Two Population Hypothesis Testing	**2**	**I, T**
ANOVA	**1**	**I, T**
Linear Regression	**1**	**I, T**
Review	**1**	**U**
Lab section		
Introduction to Anaconda, numpy	1	**U**
Use matplotlib to visualize data	1	**U**
Introduction to sci-kit learn	1	**U**
Hypothesis testing, ANOVA, linear regression in sci-kit learn	1	**U**
Final assessment	1	**U**

Examination forms	Written Exam
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.

Reading list	**Textbooks:** [1] Introduction to Probability and Statistics for Engineers and Scientists 4th ed. Sheldon M. Ross, Academic Press **References:** 1. A first course of Probability, 4th ed, Sheldon M. Ross, Prentice Hall

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	X						
2	X						
3						X	
4						X	

Intended Learning Outcomes

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a	1.3d	2.1a	2.2a				

		1.2b		2.1b					
2		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4		1.2a	1.3d		2.2b		2.4b	2.5a	

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Probability and Statistics	1		Lecture	
2 & 3	Random variables & Condition Probability	1	HW1	Lecture Think pair-share HW	
4&5	Discrete Random Variables	2	Quiz1	Lecture Quiz	
6&7	Continuous Random Variables	2	HW2	Lecture HW	
8	Sampling and Central Limit Theorems	2	HW3	Lecture HW	
9	**Midterm**				
10	One Population Hypothesis Testing	3		Lab	
11 & 12	Two Population Hypothesis Testing	3	Quiz2	Lecture Quiz	
13 & 14	ANOVA	3		Lecture HW	
15	Linear Regression	3	HW4	Lecture HW Group Project	
16	Excel Tool	4	Quiz3	- Lecture Quiz	
17	**Final exam**				

Lab section

1	Introduction to Anaconda environment and how to setup	4		Lab	Anaconda Software
2	Introduction to numpy	4			
3	Use matplotlib to visualize data	4	Quiz4	Lab	Anaconda Software
4	Use matplotlib to visualize data (cont.)	4		Lab	Anaconda Software
5	Introduction to sci-kit learn	4		Lab	Anaconda Software
6	Hypothesis testing, ANOVA,	4	HW5	Lab	Anaconda Software
7	linear regression in sci-kit learn	4		Lab	Anaconda Software
8	Final assessment	4	Quiz5	Lab	Anaconda Software

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
In-class exercises/quizzes (10%)	Qz1 60%Pass		Qz3 60%Pass	… …%Pass
Howework exercises (20%)	HW1 50%Pass	HW2 50%Pass	HW3 50%Pass	HW4 50%Pass
Midterm (30%)		60%Pass		
Final (40%)			60%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: ……. HW/Assignment: …….			
Date: …… Evaluator: ……			
	Max.	**Score**	**Comments**
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion …:			
Part 2….. (….%)			
Criterion 1 …:			
Criterion …:			
Part 3….. (….%)			
Criterion 1…:			
Criterion …:			
Part ….. (….%)			
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.

1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**

Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or

	reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 16/12/2023

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: ENGINEERING ECONOMY

Course Code: **IS020IU**

1. General information

Course designation	*This subject will provide the student with a comprehensive view of economic decisions involving engineering alternatives; annual cost, present & future worth, rate of return, and benefit-to-cost; before and after-tax replacement economy; organizational financing; break-even charts; unit and minimum-cost public sector studies.*
Semester(s) in which the course is taught	4
Person responsible for the course	MSc. Nguyen Hoang Huy
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, homework.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, etc.): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	None

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Course objectives</td><td>Students will be provided with skills of using data from a variety of sources, be introduced to basic principles of economic analysis for decision making among alternative courses of action in engineering; understand knowledge of probabilistic risks, depreciation, tax and benefit-cost ratios in analyzing engineering applications. Besides that, students can apply cash flow diagrams into economy analysis and alternative analysis techniques for engineering applications; apply techniques and methods of sensitivity analysis for engineering problems to compare and make decisions between alternatives.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1. Understand major principles of economic analysis for decision making among alternative courses of action in engineering as breakeven, costs, cash flow.
CLO2. Understand knowledge of probabilistic risks, depreciation, tax and benefit-cost ratios in analyzing engineering applications.</td></tr>
<tr><td>Skill</td><td>CLO3. Apply cash flow diagram into economy analysis and sensitivity analysis for engineering problems to compare and make decisions among alternatives.</td></tr>
<tr><td>Attitude</td><td>CLO4. Reasons around ethical and privacy issues in this course conduct and apply ethical practices.</td></tr>
</table></td></tr>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (3 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Lecture 1: Introduction to EE</td><td>1</td><td>I, T</td></tr>
<tr><td>Lecture 2: Cost concepts and Design Economics</td><td>1</td><td>I, T</td></tr>
<tr><td>Lecture 3: The time value of money</td><td>2</td><td>I, T</td></tr>
<tr><td>Lecture 4: Evaluating a single project.</td><td>2</td><td>I, T</td></tr>
<tr><td>Lecture 5: Comparison and Selection among alternatives</td><td>2</td><td>I, T</td></tr>
<tr><td>Lecture 6: Depreciation and Income taxes</td><td>2</td><td>I, T</td></tr>
<tr><td>Lecture 7: Evaluating projects with the benefit-cost ratio method</td><td>1</td><td>I, T</td></tr>
<tr><td>Lecture 8: Replacement analysis</td><td>1</td><td>I, T</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Short-answer questions, exercises</td></tr>
</table>

Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	[1] W.G. Sullivan, E.M. Wicks, C.P. Koelling (2012), Engineering Economy, 15th edition, Prentice Hall. [2] Blank, L., & Tarquin, A. (2012). Engineering Economy 7th edition. [3]Eschenbach, T. G. (2003). Engineering economy. New York: Oxford University Press.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1		x					
2		x					
3						x	
4				x			

Intended Learning Outcomes (ILO)

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	**1.1**	**1.2**	**1.3**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**
1		1.2b	1.3c	2.1a,			2.4a	2.5a	

				2.1b					
2		1.2b	1.3c	2.1a, 2.1b			2.4a	2.5a	
3	1.2a		1.3d		2.2b		2.4b	2.5a	
4	1.1b		1.3c					2.5b	2.6b

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Introduction to EE	1		Lecture, Group work	[1]. 1
2	Lecture 2: Cost concepts and Design Economics	1		Lecture, Group work	[1].2
3 & 4	Lecture 3: The time value of money	1,3,4	HW 1	Lecture, Group work	[1].4
5	Lecture 4: The time value of money (con't)	1,3,4	HW 2	Lecture, Group work	[1]. 4
6 & 7	Lecture 5: Evaluating a single project.	3	HW 3	Lecture, Group work	[1]. 5
8	Review for Midterm				
	Midterm				
9 & 10	Lecture 6: Comparison and Selection among alternatives	2, 3, 4	HW 4	Lecture, Group work	[1]. 6
11&12	Lecture 7: Depreciation and Income taxes	2, 3, 4	HW 5	Lecture, Group work	[1]. 7
13	Lecture 8: Evaluating projects with the benefit-cost ratio method	2, 3, 4	HW 6	Lecture, Group work	[1]. 10
14	Lecture 9: Replacement analysis	2, 3, 4	HW 6	Lecture, Group work	[1]. 9
15	Review for Final Exam				
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Homework exercises (30%)	HW1-2 50%Pass	HW4, HW5, HW6	HW1-6 50%Pass	HW1-6 50%Pass

		50%Pass		
Midterm exam (30%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	
Final exam (40%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response

4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 20, 2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: ENGINEERING DRAWING

Course Code: **IS102IU**

1. General information

Course designation	***This subject will provide*** **student skills to present and interpret spatial models on planar models, present engineering drawings according to international standards (ISO). Methods of presenting models: orthographic projections, isometric projection, sections of solids, … Apply the projections to present objects in the drawings.**
Semester(s) in which the course is taught	**2**
Person responsible for the course	**Nguyen Van Chung**
Language	**English**
Relation to curriculum	**Compulsory**
Teaching methods	**Lecture, Exercises.**
Workload (incl. contact hours, self-study hours)	**(Estimated) Total workload: 50** **Contact hours (please specify whether lecture, exercise, etc.): 30** **Private study including examination preparation, specified in hours[1]: 20**
Credit points	**2**

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	**None**
Course objectives	**Students will be provided with knowledge and skills of Analyzing, interpreting, and presenting engineering drawings. Applying appropriate drawing techniques for a practical application. Problem resolution on drawings. Systematically analyze the problem and apply the appropriate technique to solve the problem**
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Students will be able to Analyze, interpreting, and presenting engineering drawings.**
Skill	**CLO2. Students will be able to Apply appropriate drawing techniques for a practical application. Problem resolution on drawings**
Attitude	**CLO3. Students will have integrative knowledge for Systematically analyze the problem and apply the appropriate technique to solve the problem.**

Content	***The description of the contents should clearly indicate the weighting of the content and the level.*** **Weight: lecture and practice session** **Teaching levels: I (Introduce); T (Teach); U (Utilize)**

Topic	**Content**	**Weight (hour)**	**Level**
Introduction to Engineering drawing (ED)	Introduction to ED, Standardization Chapter 1 (K Venkata Reddy) Chapter 1 (M.B. Shah,B.C. Rana)	1	I, T
Drawing Instruments	Drawing Instrument, Drawing standards. Chapter 1 (K Venkata Reddy) Chapter 1 (M.B. Shah,B.C. Rana)	2	I, T, U
Lettering and Dimensioning	Drawing sheet layout, Lines, Lettering, Dimensioning Chapter 2 (K Venkata Reddy) Chapter 1 (M.B. Shah,B.C. Rana)	4	I, T, U
Geometrical Constructions	Geometrical constructions Chapter 4 (K Venkata Reddy) Chapter2 (K. Morling) Chapter 2 (M.B. Shah,B.C. Rana)	2	T, U
Orthographic Projection	Types of Projections, Projection of an Object, first/third angle Projection. Views of Surfaces Chapter 5, 9 (K Venkata Reddy) Chapter 3, 6, 10 (K. Morling) Chapter 3, 4, 5, 10 (M.B. Shah,B.C. Rana)	6	T, U
Midterm Exam			
Sections and Sectional Views	Types of sections, Sectional orthographic projections, Sectioning rule for machine elements Chapter 11, 12 (K Venkata Reddy) Chapter 7, 11 (M.B. Shah,B.C. Rana)	9	T, U
Part section	Representation of part section Chapter 18 (K. Morling)	6	I, T
Final Exam			

Examination forms	**Presenting engineering drawings**
Study and examination requirements	**Attendance: A minimum attendance of 70 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.** **Assignments/Examination: Students must have more than 50/100 points overall to pass this course.**

Reading list	**[1] K Venkata Reddy, *Textbook of Engineering Drawing*, BSP, 2008.** **[2] K. Morling, *Geometric and Engineering Drawing*, British Library, 2003.** **[3] M.B. Shah,B.C. Rana, *Engineering drawing*, Dorling Kindersley, 2007.** **[4] Basant Agrawal, Tata, *Engineering Drawing*, McGraw-Hill Education, 2008.**

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Program/Student Learning Outcomes (SLO) (1-7) is shown in the following table:

	PLO/SLO						
CLO	1	2	3	4	5	6	**7**
1	x						
2		x					
3				x		x	

Student Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a								
2		1.2a, 1.2b							
3								2.5a	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Engineering drawing & Drawing Instruments	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [3]
2	Lettering and Dimensioning	CLO 1,2	Exercises	Lecture presentation, in-class discussion	Reading [1] , [3]
3	Geometrical Constructions	CLO 2, 3	Exercises	Lecture presentation, in-class discussion	Reading [1] , [2], [3]
3-4-5	Orthographic Projection	CLO 2, 3	Exercises, HW	Lecture presentation, in-class discussion	Reading [1] , [2], [3]
6	**Midterm**				
7-8-9	Sections and Sectional Views	CLO 3	Exercises, HW	Lecture presentation, in-class discussion	Reading [1] , [3]
10-11	Part section	CLO 3	Quiz	Lecture presentation, in-class discussion	Reading [2]
12	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class Exercises (10%)	**Exercises 60% Pass**	**Exercises 60% Pass**	
Homework, Exercises (20%)	**Homework, Exercises 60% Pass**	**Homework, Exercises 60% Pass**	**Homework, Exercises 60% Pass**
Midterm exam (30%)	**60% Pass**	**60% Pass**	
Final exam (40%)		**60% Pass**	**60% Pass**

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (70%)			
Show the correct dimensions and letters	**15**		
Correctly represent the lines of Engineering drawings	**20**		
Correctly and fully present the requirements of the views on drawings	**35**		
Organization (10%)			
Content clearly and logically organized	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (15%)			
Layout of the views on drawings	**15**		
Clear and easy to read	**5**		
Quality of Layout and Graphics (5%)	**5**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	**3**	**2**	**1**
Explanation of issues	**Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.**	**Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.**	**Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.**	**Issue/ problem to be considered critically is stated without clarification or description.**
Evidence ***Selecting and using information to investigate a point of view or conclusion***	**Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.**	**Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.**	**Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.**	**Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.**
Influence of context and assumptions	**Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.**	**Identifies own and others' assumptions and several relevant contexts when presenting a position.**	**Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).**	**Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.**
Student's position (perspective, thesis/hypothesis)	**Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.**	**Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.**
Conclusions and related outcomes (implications and consequences)	**Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.**	**Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.**	**Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.**	**Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.**

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.**
Language	**Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.**
Delivery	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.**
Supporting Material	**A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.**
Central Message	**Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)**	**Central message is clear and consistent with the supporting material.**	**Central message is basically understandable but is not often repeated and is not memorable.**	**Central message can be deduced but is not explicitly stated in the presentation.**

Source: Association of American Colleges and Universities

6. Date revised: December 28th, 2023

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)

Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: CAD/CAM/CNC

Course Code: **IS085IU**

1. General information

Course designation	*This subject will provide design parts or mechanical products by CAD/CAM software. The students studied geometric transformations, geometric modeling, mathematical representations of curves, Wire frame modeling, surface and solid modeling. Numerical control systems and machine tools. Manual part programming, computerized part programming, CAD/CAM/CNC systems integration.*
Semester(s) in which the course is taught	5
Person responsible for the course	Nguyen Van Chung
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, Exercises, Assignment, Lab.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 80 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 50 Private study including examination preparation, specified in hours[1]: 25
Credit points	4 (3 lecture + 1 Laboratory)
Required and recommended prerequisites for joining the course	Engineering Drawing

[1] When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	Understand the fundamental and advanced concepts in computer graphics and computer-aided-design. Know the functions of a geometric solid modeler and modeling an object. Use commercial CAD/CAM software for engineering design. Understand CAD/CAM/CNC can be used in the different stages of design and manufacture of a product
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Students will be able to understand the fundamental and advanced concepts in computer graphics, computer-aided-design, and computer – aided Manufacturing.**
Skill	**CLO2. Use commercial CAD/CAM software for engineering design and manufacturing.**
Attitude	**CLO3. Understand CAD/CAM/CNC can be used in the different stages of design and manufacture of a product on CNC machines.**

Content	***The description of the contents should clearly indicate the weighting of the content and the level.*** **Weight: lecture and practice session** **Teaching levels: I (Introduce); T (Teach); U (Utilize)**

Topic	**Content**	**Weight (hour)**	**Level**
Introduction to CADCAMCNC	Introduction to CADCAM, CNC. Need for CADCAM. Hardware, software. Application. Chapter 1 (Ibrahim Zeid)	1	I, T
Geometric Transformations and Modeling	Types of geometric models. Coordinate systems. Chapter 2 (Ibrahim Zeid) Chapter 6 (P.Radhakrishman, et al)	2	I, T
Mathematical representations of Curves, surfaces, Solids	Curves, surfaces, solids Representation. Bezier, B-Spline curves and solids. Chapter 6, 7, 9 (Ibrahim Zeid)	3	T, U
CADCAM Data Exchange	Types of Interfaces, Various standard interfaces, IGES (Initial Graphics Exchange Specification)	1	T, U
Numerical Control Systems	Fundamentals of NC Technology. CNC, the components of CNC. Application Chapter 7, 23 (Mikell P. Groover)	2	T, U
Midterm Exam			
CNC Machines	Types of CNC machines. Application of CNC machines. Chapter 12 (P.Radhakrishman, et al)	2	T, U
NC programming	Types of part programming. Fundamental elements for developing manual part programming. Programming for milling and turning. Chapter 23 (Mikell P. Groover)	3	T, U
Computer-Aided Process Planning	Introduction and activities of CAPP. CAPP approaches and systems. Information required for CAPP Chapter 9 (P.Radhakrishman, et al) Chapter 24 (Mikell P. Groover)	1	T, U
CADCAMCNC Lab	Lab 1. Initiating the Graphics Package. Lab 2. Drawing of Primitives.	3	T, U

		Lab 3. Modifying Geometry, solid Lab 4. CAM, Toolpath Creation Lab 5. Simulation and Generation of NC programming Lab 6. Link with CNC machine. Lab 7. Visiting CNC machines Lab 8. Exam		
	Final Exam			

Examination forms	Practice, Writing questions
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	[1] Ibrahim Zeid, "CAD/CAM Theory and Practice", 2nd ed., Mc Graw Hill, 2009. [2] P.Radhakrishman, S. Subramanyan, V. Raju, *CAD/CAM/CIM*, New Age International Limited, Publishers, 2008. [3] Mikell P. Groover, Automation, Production Systems, and Computer-Integrated Manufacturing, 3rd edition, Prentice Hall, 2007. [4] SOFTWARE: Mastercam/Solid work/Pro-E

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	**7**
1	x						
2				x			
3						x	

Intended Learning Outcomes (ILO)

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*

5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a,1.2b	1.3d	2.1a,2.1b	2.2a				
2	1.1b		1.3c					2.5b	2.6b
3		1.2a	1.3d		2.2b		2.4b	2.5a	

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to CADCAMCNC	CLO 1		Lecture presentation, in-class discussion	Reading [1]
2, 3	Geometric Transformations and Modeling	CLO 1,2	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [1] , [2]
4, 5, 6	Mathematical representations of Curves, surfaces, Solids	CLO 1, 2	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [1] , [2]
7	CADCAM Data Exchange	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [2]
8-9	**Midterm**				
10-11	Numerical Control Systems	CLO 2, 3	Quiz, exercises	Lecture presentation, in-class discussion	Reading [1]
12-13	CNC Machines	CLO 2, 3	Quiz, exercises	Lecture presentation, in-class discussion	Reading [2]
14-15-16	NC programming	CLO 2, 3	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [3]
17	Computer-Aided Process Planning	CLO 2	Exercises	Lecture presentation, in-class discussion	Reading [3]
8 weeks	CADCAMCNC Lab	CLO 3	Assignments	Practice	Reading [4]
18	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Exercises, Quizzes, Home works (10%)	Quiz, exercies 60% Pass	Quiz, exercises, HW 60% Pass	
Lab (20%)			Practice 60% Pass
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)		60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**10**		
Analysis and discussion demonstrate good subject mastery	**35**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence ***Selecting and using information to investigate a point of view or conclusion***	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: March 30th, 2024.

Ho Chi Minh City, 26/04/2024.
Dean of School of Industrial Engineering and Management
(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: PRODUCTION MANAGEMENT

Course Code: **IS019IU**

1. General information

Course designation	**Introduction to production systems. Production planning and control in decision making. Forecasting. Aggregate production planning. Capacity planning. Materials requirement planning. Advanced techniques and approaches in modern production planning and control for designing production systems.**
Semester(s) in which the course is taught	**4**
Person responsible for the course	**Tran Van Ly**
Language	**English**
Relation to curriculum	**Compulsory**
Teaching methods	**Lecture, homework.**
Workload (incl. contact hours, self-study hours)	**(Estimated) Total workload: 70** **Contact hours (please specify whether lecture, exercise, etc.): 45** **Private study including examination preparation, specified in hours[1]: 25**
Credit points	**3**

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	**None**
Course objectives	**Students will be provided with knowledge and skills of forecasting, inventory, aggregate planning, MPS/MRP, facility layout and location, and production scheduling & sequencing.**

Course learning outcomes	**Upon the successful completion of this course students will be able to:**	
	Competency level	**Course learning outcome (CLO)**
	Knowledge	**CLO1. Able to align the project to the organization's strategic plans and business justification throughout its lifecycle; to identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders.** **CLO2. Able to manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders** **Able to implement general business concepts, practices, and tools to facilitate project success.**
	Skill	**CLO3. Work effectively in group project in a specific context; combining the techniques to conduct practical cases. Respond to the needs of community and industrial sectors**
	Attitude	**CLO4. Able to apply appropriate legal and ethical standards.** **Adapt project management practices to meet the needs of stakeholders from multiple sectors of the economy (i.e. consulting, government, arts, media, and charity organizations); Identify and follow strictly ethical disciplines in project management**

<table>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (3 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Lecture 1: Introduction to Production Management</td><td>1</td><td>I, T</td></tr>
<tr><td>Lecture 2: Forecasting</td><td>1</td><td>I, T</td></tr>
<tr><td>Lecture 3: Inventory Management</td><td>2</td><td>I, T</td></tr>
<tr><td>Lecture 4: Aggregate Planning</td><td>1</td><td>I, T</td></tr>
<tr><td>Lecture 5: Modern Production System</td><td>2</td><td>I, T</td></tr>
<tr><td>Lecture 6: Material Requirement Planning (MRP)</td><td>2</td><td>I, T</td></tr>
<tr><td>Lecture 7: Facility layout and Location</td><td>2</td><td>I, T</td></tr>
<tr><td>Lecture 8: Scheduling & Sequencing</td><td>1</td><td>I, T</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Short-answer questions, exercises</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
<tr><td>Reading list</td><td>[1] Russell & Taylor, Operations Management, Along the Supply Chain. 7th ed., John Wiley & Son, Inc.
[2] W. J. Hopp and M. L. Spearman (2008), Factory Physics: The Foundations of Manufacturing Management, 3rd ed., Irwin/McGraw-Hill.
[3] D. Sipper and R. L. Bulfin, (1997), Production: Planning, Control, and Integration, McGraw Hill.
[4] Edward A. Silver, David F. Pyke and Rein Peterson, Inventory Management and Production Planning and Scheduling, 3rd ed., John Wiley & Sons.</td></tr>
</table>

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1		**x**					

2		**x**					
3						**x**	
4				**x**			

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	**1.1**	**1.2**	**1.3**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**
1		**1.2b**	**1.3c**	**2.1a** **2.1b**			**2.4a**	**2.5a**	
2		**1.2b**	**1.3c**	**2.1a** **2.1b**			**2.4a**	**2.5a**	
3		**1.2a**	**1.3d**		**2.2b**		**2.4b**	**2.5a**	
4	**1.1b**		**1.3c**					**2.5b**	**2.6b**

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**

1	Lecture 1: Introduction to Production Management	1		Lecture, Group work	[1]. 1
2	Lecture 2: Forecasting	1	HW 1	Lecture, Group work	[1].12
3 & 4	Lecture 3: Inventory Management	1,3,4	HW 2	Lecture, Group work	[1].13
5&6	Lecture 4: Aggregate Planning	1,3,4	HW 3	Lecture, Group work	[1]. 14
7	Lecture 5: Modern Production System	3		Lecture, Group work	[1]. 16
8	Review for Midterm				
	Midterm				
9 & 10	Lecture 6: Material Requirement Planning (MRP)	2, 3, 4	HW 4	Lecture, Group work	[1]. 15
11&12	Lecture 7: Facility layout and Location	2, 3, 4	HW5	Lecture, Group work	[1]. 7
13	Lecture 8: Scheduling & Sequencing	2, 3, 4	HW 6	Lecture, Group work	[1]. 17
14	Project Presentation	2, 3, 4		Problems solving Group work	[1].
15	Review for Final Exam				
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Homework exercises (30%)	HW1-2 50%Pass	HW4, HW5, HW6 50%Pass	HW1-6 50%Pass	HW1-6 50%Pass
Midterm exam (30%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	

Final exam (40%)	**Q1 50%Pass**	**Q2 50%Pass**	**Q3, Q4 50%Pass**	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: ……..** **Date: ……** **Evaluator: ……..**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.

3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	**3**	**2**	**1**
Explanation of issues	**Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.**	**Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.**	**Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.**	**Issue/ problem to be considered critically is stated without clarification or description.**
Evidence ***Selecting and using information to investigate a point of view or conclusion***	**Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.**	**Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.**	**Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.**	**Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.**
Influence of context and assumptions	**Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.**	**Identifies own and others' assumptions and several relevant contexts when presenting a position.**	**Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).**	**Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.**
Student's position (perspective, thesis/hypothesis)	**Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.**	**Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.**

Conclusions and related outcomes (implications and consequences)	**Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.**	**Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.**	**Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.**	**Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.**

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.**
Language	**Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.**
Delivery	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.**
Supporting Material	**A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.**

Central Message	**Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)**	**Central message is clear and consistent with the supporting material.**	**Central message is basically understandable but is not often repeated and is not memorable.**	**Central message can be deduced but is not explicitly stated in the presentation.**

Source: Association of American Colleges and Universities

6. Date revised: April 20, 2024

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: INTRODUCTION TO INDUSTRIAL AND SYSTEMS ENGINEERING

Course Code: **IS001IU**

1. General information

Course designation	*This course will provide the students with an introduction to basic engineering concepts. Opportunities are provided to develop skills in oral and written communication, and department-specific material. Case studies are presented and analyzed. Students will work on interdisciplinary projects which corresponding to the building of physical models in the fields of Production, Transportation, Warehouse, and other industrial engineering related fields*
Semester(s) in which the course is taught	2
Person responsible for the course	Dr Ha Thi Xuan Chi
Language	English
Relation to curriculum	Compulsory
Teaching methods	Group project, discussion, laboratory.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 40 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 15 Private study including examination preparation, specified in hours[1]: 25
Credit points	1
Required and recommended prerequisites for joining the course	None

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Course objectives</td><td>Introduction to basic engineering concepts. Opportunities are provided to develop skills in oral and written communication, and department-specific material. CaseA studies are presented and analyzed. Students will work on interdisciplinary projects which corresponding to the building of physical models in the fields of Production, Transportation, Warehouse, and other industrial engineering related fields

.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1. Students have integrative knowledge of the basis and importance of Industrial Engineering and Management systems

CLO2. Student have integrative knowledge, techniques and skills which enhance student’s life-long learning ability.</td></tr>
<tr><td>Skill</td><td>CLO3. Students are able to cooperate with others, organize and implement industry-related projects effectively and get used to leadership.</td></tr>
<tr><td>Attitude</td><td>CLO4. Students develop life-long learning attitude implementing engineering blueprints in cooperation with engineers and non-engineers.</td></tr>
</table></td></tr>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture and practice session (3 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight (hour)</th><th>Level</th></tr>
<tr><td>Introduction to Industrial and Systems Engineering</td><td>1</td><td>I</td></tr>
<tr><td>Introduction to Electrical and Automation Engineering</td><td>1</td><td>I, T</td></tr>
<tr><td>Students do the project at Laboratory</td><td>12</td><td>U</td></tr>
<tr><td>Group project presentation and demonstration</td><td>1</td><td>U</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Project- based group presentation</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
</table>

Reading list	

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	**7**
1					x		
2			x				
3					x		
4							x

Intended Learning Outcomes

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	**1.1c**		**1.3b**						**2.6a**
2	**1.1c**		**1.3a**						**2.6a**
3	**1.1c**		**1.3b**						**2.6a**
4	**1.1a** **1.1b** **1.1c**		**1.3c**			**2.3a**	**2.4c**		

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Industrial and Systems Engineering	1, 2	Project	Lecture-advice, lab, team work, Q&A	
2	Introduction to Electrical and Automation Engineering	1, 2	Project	Lecture-advice, lab, team work, Q&A	
3-14	Students do the project at Laboratory	1,2,3, 4	Project	Lecture-advice, lab, team work, Q&A	
15	Group project presentation and demonstration	4	Project	Group presentation, Q&A	

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Group projects (100%)	**Group project 80% Pass**	**Group project 80% Pass**	**Group project 80% Pass**	**Group project 80% Pass**

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		

Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence ***Selecting and using information to investigate a point of view or conclusion***	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 15th, 2024

Ho Chi Minh City, 26/ 04/ 2024
Dean of School of Industrial Engineering and Management
(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: DETERMINISTIC MODELS IN OPERATIONS RESEARCH

Course Code: IS103IU

1. General information

Course designation	This course provides knowledge to develop linear programming and integer programming formulations for engineering and economic systems, determine optimal solutions to a variety of mathematical programming problems, and present managerial recommendations based on optimal solutions and sensitivity analysis.
Semester(s) in which the course is taught	2
Person responsible for the course	*Dr. Ha Thi Xuan Chi*
Language	English
Relation to curriculum	*Compulsory*
Teaching methods	*Lecture, lesson, project*
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (lecture): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	**3 credits**

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	
Course objectives	On completion of this course, the student will be able to develop linear programming and integer programming formulations for engineering and economic systems, determine optimal solutions to a variety of mathematical programming problems, and present managerial recommendations based on optimal solutions and sensitivity analysis.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Able to define a mathematical model, formulate a mathematical model with 2 variables, Able to solve a mathematical model with 2 variables by graphical method** **CLO2. Able to formulate a mathematical model with more than 2 variables, solve a mathematical model with more than 2 variables by simplex method, big M technique, two phase and revised method.** **CLO3. Able to formulate Integer programming, Dynamic Programming, transportation, assignment, shortest paths problems, maximum flow, minimize costs models, solve by using techniques: Branch and Bound, Min-Cut Theory, Djkstra Algorithm**
Skill	**CLO4. Able to use CPLEX/LINGO software to solve complex problems.** **CLO5. Able to analyses output from the linear programming model by using sensitivity analysis and using duality theory to interpret economic meaning** **CLO6. Solve NLPs with one variable and several variables**

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Introduction to Operations Research	**1**	**I, T**
Formulating linear programming problems.	**2**	**I, T**
Solution of an LP: Graphical Solution.	**1**	**I, T**
Solution of an LP: Simplex Method, Standard Form, Degeneracy, Alternate Solutions, Unbounded LP, Infeasible LP.	**2**	**I, T**
Solution of an LP: Finding an initial feasible solution, Big-M Method, Two-Phase Method, Solution of an LP using a software package - LINDO.	**2**	**I, T**
Revised Simplex Method, Simplex Formulas, Shadow Price, Reduce Cost.	**2**	**I, T**
Sensitivity Analysis: Changing the objective function coefficient of a basic variable, changing the objective function coefficient of a nonbasic variable, changing the constraint coefficient of a nonbasic variable, changing the RHS values of constraints, adding a new variable.	**1**	**T, U**
LINGO/CPLEX: **Introduction** **Solving Linear Programming Problem**	**0.5**	**T, U**
Duality Theorem, Finding the dual of an LP, Economic Interpretation of the Dual Problem and Dual Variables, Dual Simplex Method, How to	**0.5**	**I, T**
Network optimization: Shortest Path Problems: Formulating Equipment replacement problem as Shortest Path Problems, Solving shortest path problems using Dijkstra¡'s Algorithm		**T**
Integer Programming Problems. Either/or Constraints, If then Constraints, Fixed Charge Problems, Solving Integer Programs using Branch and Bound Method.		**T**
Dynamic programming Problems		**T**
LINGO/CPLEX **Solving Network Optimization, IP problems, DP problems**		**T**

	Nonlinear programming: Solving with one variable and serveral variables Karush–Kuhn–Tucker		**T**
Examination forms	Written Exam		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	**Textbooks:** [1] Introduction to Operation Research 9th ed. Hillier,Lieberman, McGrawHill [2] Introduction to Mathematical Programming fourth edtion, Wayne L. Winston, Munirpallam Venkataramanan. **References:** 1. Bodhibrata Nag, *Business Applications of Operations Research*, Business Expert Press, 2014. ISBN-13: 978-1-60649-526-1. 2. R.K. Ahuja, T.L.,Magnanti, J.B. Orlin, *Network Flows: Theory, Algorithms, and Applications*, Prentice Hall, 1993. ISBN 0 -13-617549-X. 3.. M.S. Bazaraa, H.d. Sherali, C.M. Shetty, *Nonlinear Programming: Theory and Algorithms*, John Wiley &Sons, 1993, 2nd edition. ISBN 0-471-55793-5. 4. G.C. Onwubolu, and B.V.Babu (edited), *New Optimization Techniques in Engineering* – Nguyen Van Hop, and M.T. Tabucanon, *Chapter 14: Improvement of Search Genetic Algorithms: An Application of PCB Assembly Sequencing Problem*, Springer-Verlag, Heitzberg, Germany, 2003. ISBN 1434 – 9922. 5. Hamdy A. Taha, *Operation Research: An Introduction*, Prentice Hall, 2017, 10th Edition. ISBN-13: 978-1-292-16554-7		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	X	X					
2	X	X					
3	X	X					
4						X	
5						X	
6	X	X					

Intended Learning Outcomes

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a,b	1.3c,d	2.1a,b	2.2a		2.4a	2.5a	
2		1.2a,b	1.3c,d	2.1a,b	2.2a		2.4a	2.5a	
3		1.2a,b	1.3c,d	2.1a,b	2.2a		2.4a	2.5a	
4		1.2a	1.3d		2.2b		2.4b	2.5a	
5		**1.2a**	1.3d		2.2b		2.4b	2.5a	
6		1.2a,b	1.3c,d	2.1a,b	2.2a		2.4a	2.5a	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Operations Research	1		Lecture	
2	Formulating linear programming problems.	1	HW1	Lecture Think pair-share HW	
3	Solution of an LP: Graphical Solution.	1	Quiz1	Lecture Quiz	
4&5	Solution of an LP: Finding an initial feasible solution, Big-M Method, Two-Phase Method	2	HW2	Lecture HW	
6&7	Sensitivity Analysis: Changing the objective function coefficient of a basic variable, changing the objective function coefficient of a nonbasic variable, changing the constraint coefficient of a nonbasic variable, changing the RHS values of constraints, adding a new variable.	2, 4	HW3	Lecture HW Class discussio n	
8	Review	2	HW4	Lecture HW	
	Midterm				
9	LINGO/CPLEX: Introduction Solving Linear Programming Problem	4		Lab	
10&11	Network optimization: Shortest Path Problems: Formulating Equipment replacement problem as Shortest Path Problems, Solving shortest path problems using Dijkstra¡'s.	5	HW5	Lecture HW	
12	Integer Programming Problems.	3		Lecture Concept mapping - Think pair-share	
13	Dynamic programming Problems	3	Quiz	Lecture HW Quiz	
14	LINGO/CPLEX Solving Network Optimization, IP problems, DP problems	3		- Lecture	
15	Review	5			
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
In-class exercises/quizzes (10%)	Qz1 60%Pass		Qz3 60%Pass	… …%Pass	Qz2 60%Pass	
Howework exercises (20%)	HW1 50%Pass	HW2 50%Pass HW3 50%Pass	HW3 50%Pass HW6 50%Pass	HW3 50%Pass	HW5 50%Pass	
Midterm (30%)		60%Pass			60%Pass	
Final (40%)			60%Pass			60%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (80%)			
Problem Identification: Be able to identify different logistics and supply chain problems	**20**		
Data collection and software usage: Know how to transform the data into the proper form and solve the models using computer-based software such as CPLEX, LINGO, PyCharm, MATLAB, etc.	**20**		
Methodology: Know how to formulate and solve different logistics and supply chain problems by using the mathematical techniques	**20**		
Solution and Implementations: Be able to solve practical problems and do the output analysis.	**20**		
Report writing and Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW

Score	Description
5	**Demonstrates complete understanding of the problem. All requirements of task are included in response**
4	**Demonstrates considerable understanding of the problem. All requirements of task are included.**
3	**Demonstrates partial understanding of the problem. Most requirements of task are included.**
2	**Demonstrates little understanding of the problem. Many requirements of task are missing.**
1	**Demonstrates no understanding of the problem.**
0	**No response/task not attempted**

Note: This rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

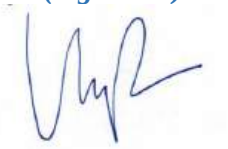
Source: Association of American Colleges and Universities

6. Date revised:

Ho Chi Minh City, dd/mm/yyyy

Dean of School of Industrial Engineering and Management

(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: WORK DESIGN & ERGONOMICS

Course Code: **IS017IU**

1. General information

Course designation	*This subject will provide Problem solving tools (recording and analysis tools, activity charts). Operation analysis, manual work design (principles of motion economy, motion study). Time study (performance rating and allowances), predetermined time systems. Work environment design.*
Semester(s) in which the course is taught	4
Person responsible for the course	Nguyen Van Chung
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, Laboratory
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 (45 lecture + 15 Lab) Private study including examination preparation, specified in hours[1]: 30
Credit points	4 (3 lecture + 1 laboratory)
Required and recommended prerequisites for joining the course	None

[1] When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	Students will be provided with the basic concepts of work design and ergonomics. Understand different methods of engineering and operations analysis, motion study, work design, lifting. Alternative solution methodologies are available in time study, ergonomics, and human factors. To increase productivity, machine/ equipment utilization, and to reduce human efforts, and to motivate and product employees' health.
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	Course learning outcome (CLO)
Knowledge	CLO1. Students will be able to Recognize and understand basic concepts of work design and ergonomics. and solve complex tasks and problems across several disciplines from global, economic, environmental, and societal aspects.
Skill	CLO2. Students will be able to identify different methods of engineering and operations analysis, and solve the motions, the postures, work design, lifting, and time problems by applying principles of basic motion elements and Ergonomics, to evaluate and choose alternative solution methodologies.
Attitude	CLO3. Students will Apply knowledge in work design and ergonomics to increase productivity, machine/ equipment utilization, and to reduce human efforts, and to motivate and product employees' health.

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture and practice session

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Content**	**Weight (hour)**	**Level**
Introduction to Work design and Ergonomics	Introduction to the work, work element, basic motion element, Work system. Chapter 1 (Mikell P. Groover)	1	I, T
Methods Engineering and Graphical tools for Operations Analysis	Introduction to the method engineering, Operation analysis. And analysis tools. Chapter 8 (Mikell P. Groover)	1	I, T
Motion/Methods Study and Work Design	Basic motion elements and work analysis. Principles of motion economy and work design. Chapter 2, 10 (Mikell P. Groover)	2	T, U
NIOSH Lifting Equation	NIOSH Lifting equation, Recommended weight limit. T. R. Water, V. P. Anderson, A. Garg	2	T, U
Midterm Exam			
Introduction to Time Study	Determine time standard, Allowances. Chapter 12 (Mikell P. Groover)	1	T
Direct Time Study	Direct time study procedure, Performance rating, time study equipment. Chapter 13 (Mikell P. Groover)	2	T, U
Predetermined Motion Time Systems	Methods – time measurement. Chapter 14 (Mikell P. Groover)	2	T, U
Ergonomics and Human Factors	Introduction to ergonomics and human factors, anthropometry, design guidelines for cognitive work. Chapter 22, 23, 24 (Mikell P. Groover)	2	T, U
Learning Curves	Learning curve theory, determining and application of learning curve. Chapter 19 (Mikell P. Groover)	0.5	I, T
Laboratory 1 Measurement of Grip strength	To measure and compare grip strength of right and left hands. Compare with Grip strength test norms	1	U

	Laboratory 2 Measurement of working environment factors	To measure the intensity of illumination, sound level, distance, temperature, and practice on measuring instruments	1	U
	Laboratory 3 Introducing Ergonomics software	Introduction to TK Motion Manager Software by NexGen Ergonomics	1	U
	Laboratory 4 Evaluate and Optimize the workplace	The workplace to use the computer and to assemble the product	2	U
	Laboratory 5 Work Design, Motion and Time study	To design the job, analyze the basic motion elements and measure the time.	2	U
	Laboratory 6 Lifting Equation	Using the NIOSH lifting analysis in a biomechanical analysis. To calculate Recommended Weight limit	2	U
	Laboratory 7 Anthropometric Measurement	Identify the correct human body dimensions used to design a product, workstation, equipment, etc.	2	U
	Laboratory 8 Ergonomics in the workplace	Analyze the current state of the workplace and propose improvements to the workplace according to Ergonomics. (Computer rooms, Lab, Libraries, Canteens, …)	2	U
	Final Exam			
Examination forms	**Writing questions**			
Study and examination requirements	**Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.** **Assignments/Examination: Students must have more than 50/100 points overall to pass this course.**			
Reading list	**[1] Mikell P. Groover, *Work Systems and the Methods, Measurement, and Management of Work*, Prentice-Hall, 2007.** **[2] A. Freivalds and B. Niebel, *Niebel's Methods, Standards, and Work Design*, McGraw-Hill, 2009.** **[3] T. R. Water, V. P. Anderson, A. Garg, *Applications Manual for the Revised NIOSH Lofting Equation,* Cincinnati, Ohio 45226, 1994.**			

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1		x					
2	x						
3						x	

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
2		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
3		1.2a	1.3d		2.2b		2.4b	2.5 a	

3. Planned learning activities and teaching methods.

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Work design and Ergonomics	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [2]

2	Methods Engineering and Graphical tools for Operations Analysis	CLO 1,2	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [1] , [2]
3-4-5	Motion/Methods Study and Work Design	CLO 2, 3	Exercises, Assignment	Lecture presentation, in-class discussion	Reading [1] , [2]
6-7	NIOSH Lifting Equation	CLO 2, 3	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [3]
8-9	**Midterm**				
10	Introduction to Time Study	CLO 1		Lecture presentation, in-class discussion	Reading [1]
11-12	Direct Time Study	CLO 2, 3	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [1] , [2]
13-14	Predetermined Motion Time Systems	CLO 2, 3	Exercises, Assignment	Lecture presentation, in-class discussion	Reading [1] , [2]
15-16	Ergonomics and Human Factors	CLO 1, 2, 3	Exercises	Lecture presentation, in-class discussion	Reading [1] , [2]
17	Learning Curves	CLO 1		Lecture presentation, in-class discussion	Reading [1]
8 weeks	*Laboratory 1* (1 week) Measurement of Grip strength *Laboratory 2* (1 week) Measurement of working environment factors *Laboratory 3* (1 week) Introducing Ergonomics software. *Laboratory 4* (1 week) Evaluate and Optimize the workplace. *Laboratory 5* (1 weeks) Motion study and Time study *Laboratory 6* (1 week) Lifting Equation *Laboratory 7* (1 week) Anthropometric Measurement *Laboratory 8 (1 week)* Ergonomics in the	CLO 3	Practices		

	workplace				
18	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
In-class assignment (10%)	Quiz 60% Pass	Group Assignment 60% Pass	
Group Lab (20%)			Group Lab 80% Pass
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)		60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Clearly identify the problems and the purpose	**10**		
Introduction demonstrates thorough knowledge of relevant background	**10**		
Analysis and discussion demonstrate good subject mastery	**35**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence ***Selecting and using information to investigate a point of view or conclusion***	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: March 30th, 2024.

Ho Chi Minh City, 30/03/2024
Dean of School of Industrial Engineering and Management
(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Product design and development

Course Code: **IS034IU**

1. General information

Course designation	Product Design and Development course introduces to the students the role of multiple functions in creating a new product (e.g. marketing, finance, industrial design, engineering, production) as well as tools and methods for product design and development.
Semester(s) in which the course is taught	5
Person responsible for the course	Dr. Dao Vu Truong Son
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, Exercises, Assignment.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	Nil

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	Product Design and Development course introduces to the students the role of multiple functions in creating a new product (e.g. marketing, finance, industrial design, engineering, production) as well as tools and methods for product design and development. Highlight of the course is the project in which the students will design a new product and produce a prototype version of it. Project ideas come from the students in the class and project teams are formed based on expressed student preferences. Throughout the project, the students will apply their learned principles and methods of product development in a realistic context. The course also enables the students to coordinate interdisciplinary tasks in order to achieve a common objective.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Understanding the role of multiple functions in creating a new product** **CLO2. Understand the product development process.**
Skill	**CLO3. Applying in design a new product and produce a prototype version**
Attitude	**CLO4. Students will have positive attitude in both self-learning and group discussion with other disciplines related to engineering mechanic related problems.**

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Introduction to Product design & Development	**3**	**I, T**
Identify Customer needs	**3**	**I, T**
Project selection Product planning	**3**	**I, T**
Product specifications	**3**	**I, T**
Product architecture.	**3**	**I, T**
Concept generation/selection/testing	**9**	**T, U**
Prototyping	**3**	**I, T**
Industrial design/Design for Manufacturing	**3**	**I, T**
Product development economics	**3**	**I, T**

Examination forms	Practice, Writing questions

Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	Karl T. Ulrich & Steven D. Eppinger, Product design & development – 5th Edition, McGraw-Hill, 2012.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-6) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	x						
2		x					
3			x	x			
4					x	x	

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3	1.1b 1.1c		1.3a 1.3c					2.5b	2.6a 2.6b
4	1.1c	1.2a	1.3b 1.3d		2.2b		2.4b	2.a	2.6a

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Product design & Development	1	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].1
2	Identify Customer needs	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].2
3	Project selection Product planning	2,3	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 3
4	Product specifications	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 4
5	Product architecture.	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 5
6,7	Concept generation/selection	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 6,7
8	Review				
9	Midterm				
10	Concept Testing	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].8
11	Prototyping	1,2	Exercises, HW, Quiz	Lecture, Discussion, Inclass-Quiz	[1].9
12	Industrial design/Design for Manufacturing	3, 4	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].10
13	Product development economics	3,4	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].11
14	Project presentation	3,4			
18	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Project (30%)			50% Pass	50% Pass
Midterm exam (30%)	60% Pass	60% Pass		
Final exam (40%)		60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (65%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**35**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (5%)	**05**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

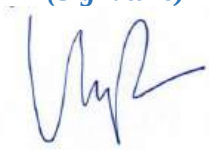
	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 15, 2024

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Simulation models in industrial engineering

Course Code: **IS028IU**

1. General information

Course designation	Modeling and analysis of industrial and service systems, modeling perspectives, discrete event and continuous simulation, model building using ARENA/SIMAN, statistical aspects of simulation.
Semester(s) in which the course is taught	7
Person responsible for the course	Dr. Pham Huynh Tram
Language	English
Relation to curriculum	Compulsive
Teaching methods	Lecture, project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (lecture):45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	Engineering Probability and Statistics
Course objectives	1. Identify, formulate and solve complex problems in manufacturing and service systems by performing discrete-event system simulation and applying knowledge of statistics 2. Use simulation as a tool in the process of engineering design to produce solutions that meet specified needs with consideration of economic factors. 3. Conduct experimentation via simulation, analyze the data and draw valid conclusion 4. Work effectively in group project
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Able to apply knowledge of statistics such as random distributions and hypothesis testing in different steps of a simulation study**
Knowledge	**CLO2.1 Able to carry out simulation study of manufacturing or service cases following a standard procedure**
Skill	**CLO2.2 Able to use Arena software as a tool to create a simulation model**
Knowledge	**CLO2.3 Able to consider different system constraints, requirements and economic factors in a simulation study**
Skill	**CLO3. Able to do experimentation in simulation in Arena, read and interpret the report results**
Attitude	**CLO4.1 Able to collaborate and/or lead in a project team, plan tasks and meet project objectives**
Skill	**CLO4.2Able to write a technical report**
Skill	**CLO4.3 Able to give presentation before class**

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic (Theory)	**Weight**	**Level**
Basics of discrete-event simulation	**1.5**	**U**
Simulation examples in a spreadsheet	**2**	**U**
Elements of Probability and Statistics	**0.5**	**T**
Random Numbers	**1**	**T**
Random variates	**1.5**	**T**
Input modeling	**2**	**U**
Verification and validation	**1**	**U**
Absolute Output analysis	**2**	**U**
Relative Output analysis - simulation optimization	**2**	**U**
Project- case study	**1.5**	**U**
Topic (LAB)		
Modelling Production Lines	**3**	**U**
Modelling Service System	**3**	**U**
Modelling Supply chain system	**3**	**U**
Modelling material handling system	**3**	**U**

Examination forms	Writing, project presentation
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.

Reading list	Textbooks: [1] Banks, J., Carson, J. S., Nelson, B. L., and Nicol, D. M., "Discrete-Event System Simulation", 4th edition, Prentice-Hall, 2005. [2] Kelton, W. D., Sadowski, R. P., and Sturrock, D. T., "Simulation with Arena", McGraw-Hill, New York (fourth edition), 2006. References: [3] Tayfur Altiok, Benjamin Melamed, "Simulation modeling and analysis with Arena", Academic Press (Elsevier) 2007 Software: ARENA Software version: 16.00 Licenses: Academic for students, unlimited

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO						
CLO	1	2	3	4	5	6	7
1	x						
2		x					
3						x	
4			x		x		

Student Learning Outcomes

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a,b	1.3d	2.1a,b	2.2a				
2		1.2b	1.3c	2.1a,b			2.4a	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4	1.1c		1.3a						2.6a

3. Planned learning activities and teaching methods

Theory

Week	Content	CLOs	Assessment	Resources
1,2	Introduction Basics of discrete-event simulation	2.1	Project	Reading: Banks – Chapter 1 (Kelton – Chapter 1 Altiok – Chapter 1) Banks – Chapter 3 Kelton – Chapter 2
3,4	Simulation examples in a spreadsheet	2.1	Midterm	Reading: Banks – Chapter 2 (Kelton – Chapter 2)
5,6	Elements of Probability and Statistics Random Numbers	1	Midterm	Reading: Banks-Chapter 5 Altiok- Chapter 3 Banks-Chapter 7 (Altiok- Chapter 4)
7	Random variates	1	Midterm	Reading: Banks-Chapter 7 (Altiok- Chapter 4)
8	Project Presentation (conceptual model)			
Midterm exam				
9,10	Input modeling	1 2.1	Project Final	Reading: Banks – Chapter 9 Kelton – Chapter 4.6 Altiok – Chapter 7
11&12	Verification and validation	1 2.1	Project Final	Reading: Banks – Chapter 10 Kelton – Chapter 4.5 Altiok – Chapter 8
13	Absolute Output analysis	1 2.1 2.3	Project Final	Reading: Banks – Chapter 11 Kelton – Chapter 7 Altiok – Chapter 9

14	Relative Output analysis Simulation optimization	1 2.1 2.3	Project Final	Reading: Banks – Chapter 12 Kelton – Chapter 6 Altiok – Chapter 9
15	Project Presentation	4		
Final exam				

Laboratory

Week	Content	CLOs	Assessment	Resources
1a	**Introduction** Introduction to Arena (Arena Window) Example: A Simple Process System • Flowchart Module: Create, Process, Dispose • Data Module: Entity, Resource, Queue; • Viewing report	2.2	HW Midterm	-Reading: Kelton – Chapter 3 (Model 3-1)
1b	**Modeling Production Line**s Example: An Electronic Assembly & Test System • Flowchart Module: Assign, Decide, Record • Data Module: Variables, Attributes, Expression, Schedule, Failure, Statistics • Viewing Report	2.2 3	HW Midterm	-Reading:Kelton – Chapter 3 (Model 4-1, 4-2)
2	**Modeling Production Line (cont)** Example: Other types of production lines: packaging, batch processing, assembly -Flowchart Module: Hold, Batch, Separate, Match	2.2 3	HW Midterm Quiz	-Reading:Altiok – Chapter 11
3	**Modeling Service system** Example: A call center	2.2 3	HW Midterm	-Reading:Kelton – Chapter 5 (Model 5-1)
4	**Modeling Service system (cont)** Example: A call center	2.2 3	HW Midterm Quiz	-Reading:Kelton – Chapter 5 (Model 5-2)
Midterm exam				
5	**Modeling Supply Chain System** Example: An Inventory System	2.2 3	HW Final	-Reading: Altiok – Chapter 12.1

6	**Modeling Transportation System** Example: A Small Manufacturing System • Flowchart Module: Station, Route, • Data Module: Sequence	2.2 3	HW Final Quiz	-Reading: Kelton – Chapter 7 (Model 7.1)
7	**Modeling Transportation System** Example: A small Manufacturing System with Entity Transfer	2.2 3	HW Final	-Reading: Kelton – Chapter 8 (Model 8.1)
8	**Other techniques in Arena** • Input data • DOE • Optimization	2.2 3	HW Final Quiz	-Reading: Kelton – Chapter 10, 6
Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Project (10%)	x	x	x	x
Homework (20%) Quiz (10%)		x	x	
Midterm exam (30%) - Theory (18%) - Lab (12%)	x	x	x	
Final exam -Theory (18%) - Lab (12%)	x	x	x	

Note: %Pass: Target 70% of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant	**15**		

background and prior work			
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling,	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting,	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and

	and speaker appears polished and confident.	and speaker appears comfortable.	understandable, and speaker appears tentative.	speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 2022

	Ho Chi Minh City, dd/mm/yyyy ***Head/Dean of Department/School*** ***(Signature)*** ***<Full Name>***

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: SCHEDULING & SEQUENCING

Course Code: **IS027IU**

1. General information

Course designation	
Semester(s) in which the course is taught	2
Person responsible for the course	*Dr. Phan Nguyen Ky Phuc*
Language	English
Relation to curriculum	*Compulsory*
Teaching methods	*Lecture, lesson, project*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload:* *Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45* *Private study including examination preparation, specified in hours[1]:*
Credit points	3
Required and recommended prerequisites for joining the course	

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	This course gives an introduction to scheduling problems: techniques, principles, algorithms and computerized scheduling systems. Topics include scheduling algorithms for single machine, parallel machine, flow shop, job shop and also solution methodologies such as heuristic procedures, constructive algorithms, branch and bound approaches, and genetic algorithms.
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1 Students are able to master the basic knowledge of modeling different shop configurations, manufacturing scheduling problems, and performance measures. CLO2. Students are able to master the basic knowledge of identifying basic algorithms and procedures to use in different shop configurations. CLO3. Students are able to use different methods to solve engineering tasks by selecting different available methodologies in manufacturing and service scheduling problems.
Skill	CLO4 Students are able to apply their knowledge and develop practical skills for solving problems, by using LINGO, CPLEX, Python software

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Introduction to Scheduling	**1**	**I, T**
How to build constraints	**2**	**I, T**
CPLEX software	**2**	**U**
PERT model	**1**	**I, T**
Single Machine Dispatching Rule Model	**2**	**I, T**
Scheduling with Workforce Constrain	**2**	**I, T**
Job shop scheduling- Exact Math Model	**2**	**I, T**
Job shop scheduling- Shifting Bottle Neck	**1**	**I, T**
Scheduling of Flexible Assembly Systems	**1**	**I, T**
Scheduling in Flexible Flowshop and Jobshop	**1**	**I, T**
Workforce Scheduling	**1**	**I, T**

Examination forms	**Written Exam**
Study and examination requirements	**Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.** **Assignments/Examination: Students must have more than 50/100 points overall to pass this course.**
Reading list	**Textbooks:** [1] M. L. Pinedo, Scheduling: Theory, Algorithms, and Systems, 3rd edition, Springer, 2008. **References:**

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

		ILO					
CLO	1	2	3	4	5	6	7
1	X						
2	X						
3						X	
4						X	

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze*

and interpret data, and use engineering judgment to draw conclusions

7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2a 1.2b	1.3d	2,1a 2.1b	2.2a				
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4		1.2a	1.3d		2.2b		2.4b	2.5a	

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Scheduling	1		Lecture	
2 & 3	How to build constraints	2,3	HW1	Lecture Think pair-share HW	
4&5	CPLEX software	4	Quiz1	Lecture Quiz	
6	PERT model	2,3	HW2	Lecture HW	
7&8	Single Machine Dispatching Rule Model	2,3	HW3	Lecture HW	
9	**Midterm**				
10	Scheduling with Workforce Constrain	2,3		Lab	
11	Job shop scheduling- Exact Math Model	2,3	Quiz2	Lecture Quiz	

12	Job shop scheduling- Shifting Bottle Neck	2,3		Lecture HW	
13&14	Scheduling of Flexible Assembly Systems	2,3	HW4	Lecture HW Group Project	
15	Scheduling in Flexible Flowshop and Jobshop	2,3	Quiz3	- Lecture Quiz	
16	Workforce Scheduling	2,3			
17	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
In-class exercises/quizzes (10%)	Qz1 60% Pass		Qz3 60% Pass	… …%Pass
Howework exercises (20%)	HW1 50% Pass	HW2 50% Pass	HW3 50% Pass	HW4 50%Pass
Midterm (30%)		60% Pass		
Final (40%)			60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion …:			

Part 2….. (….%)			
Criterion 1 …:			
Criterion …:			
Part 3….. (….%)			
Criterion 1…:			
Criterion …:			
Part ….. (….%)			
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	**Demonstrates complete understanding of the problem. All requirements of task are included in response**
4	**Demonstrates considerable understanding of the problem. All requirements of task are included.**
3	**Demonstrates partial understanding of the problem. Most requirements of task are included.**
2	**Demonstrates little understanding of the problem. Many requirements of task are missing.**
1	**Demonstrates no understanding of the problem.**
0	**No response/task not attempted**

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

Evidence ***Selecting and using information to investigate a point of view or conclusion***	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and

	polished and confident.	comfortable.	speaker appears tentative.	speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

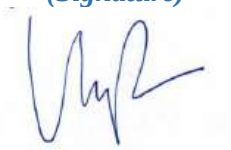
Source: Association of American Colleges and Universities

6. Date revised: 11/04/2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: INVENTORY MANAGEMENT

Course Code: **IS023IU**

1. General information

Course designation	This course is essential for students to have a thorough understanding of the phylosophy, tools and techniques of inventory management. This course is aimed at providing the background and skills necessary for effective inventory management using a systems approach for an entire supply chain management. This course will cover the following contents: inventory models for deterministic demands, inventory models for stochastic demands, coordinated ordering, and inventory models for multiechelon systems.
Semester(s) in which the course is taught	1
Person responsible for the course	*Assoc.Prof. Dr. Nguyen Van Hop.*
Language	English
Relation to curriculum	Compulsory
Teaching methods	*lectures, lessons, project, homeworks, quizs.*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload:45* *Contact hours (please specify whether lecture, exercise, laboratory session, etc.):42 lecture hours.* *Private study including examination preparation, specified in hours[1]: 3 hours for project presentation*
Credit points	3 credits (5 ECTS)

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	Nil.
Course objectives	This course aims to provide for student to: ● Students understand basic concepts and key aspects of inventory management. ● Students understand the importance of inventory and its position within logistics and supply chain systems. ● Students understand fundamental inventory control models (deterministic vs stochastic, single item vs multiple items, etc.). ● Students know how to determine when to re-order, safety stock level, and order quantity when demand is deterministic. ● Students know how to determine when to re-order, safety stock level, and order quantity when demand is stochastic. .
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1. Understanding of concepts, key points, and primary challenges of inventory management based on Engineering, Scientific, and Economic knowledge. Able to build the framework to control and manage inventory system. Able to identify different issues and problems, and develop the KPIs to measure the performance to control and manage an inventory system.
Skill	CLO2. Apply engineering methods and holistic and systematic approaches to identify, formulate and solve different inventory control problems by using optimization tools and advanced knowledge of natural sciences, mathematics and engineering. Students are able to collect input data, analyze parameters, formulate and solve practical inventory problems, conduct detailed research, conduct experiments and analyze the solutions by evaluating, planning, choosing and applying adequate methods of modeling, simulation, design and implementation of technical and economic systems.
Attitude	CLO3. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issues in the working environment.

<table>
<tr><td>Content</td><td>

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Introduction to inventory management</td><td>1</td><td>I</td></tr>
<tr><td>Inventory models for single item with time varying demand at approximate level</td><td>1</td><td>I, T, U</td></tr>
<tr><td>Losizing models with time varying demand</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Inventory Management under Stochastic Demand</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Managing Classs A Items</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Perisable Items</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Multiple Items: Coordinated Ordering</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Multi-echelon Inventories</td><td>2</td><td>I, T, U</td></tr>
</table>

</td></tr>
<tr><td>Examination forms</td><td>Written Examination</td></tr>
<tr><td>Study and examination requirements</td><td>

Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Assignments/ Examination: Students must have more than 50/100 points overall to pass this course.

</td></tr>
<tr><td>Reading list</td><td>

Textbooks:

- Edward A. Silver, David F. Pyke, Douglas J. Thomas, (2017). *Inventory and Production Management in Supply Chains.* 4th Edition, CRC Press, Taylor & Francis, New York.

References:

- E. L. Porteus (2002). *Foundations of Stochastic Inventory Theory*. Stanford Univ. Press.
- P. H. Zipkin, (2000). *Foundations of Inventory Management*. Irwin/McGraw-Hill.
- Steven M. Bragg, (2005). *Inventory Accounting a comprehensive guide*. Wiley.
- John A. Muckstadt, Amar Sapra, (2010). *Principle of Inventory Management*. Springer.
- Steven Axsater, (2015). *Inventory Control*, Springer.
- Journals: Operations Research, European Journal of Operational Research, International Journal of Production Economics, Computers & Operations Research, Computers & Industrial Engineering.

</td></tr>
</table>

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	x			x			x
2	x	x				x	
3			x	x	x		

Intended Learning Outcomes (ILO)

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a, 1.1b, 1.1c	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a	2.3a	2.4c	2.5b	2.6b
2	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b		2.4a, 2.4b	2.5a		
3	1.1b, 1.1c		1.3a 1.3b 1.3c					2.5b	2.6a 2.6b

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources

1	Introduction to inventory management	1		Lecture Group forming. Class discussion Read book & lecture 2	
2	Inventory models for single item with time varying demand at approximate level	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 3.	
3	Lotsizing models with time varying demand	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 4.	
4	Lotsizing models with time varying demand	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 5.	
5	Inventory Management under Stochastic Demand	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 6.	
6	Inventory Management under Stochastic Demand	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 7	
7	Managing Classs A Items	1, 2,3,4	HW	Lecture Class discussion	
8	Managing Classs A Items	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 9.	
	Midterm		Written Exam		
9	Perisable Items	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 10.	
10	Perisable Items	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 11	
11	Multiple Items: Coordinated Ordering	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 12	
12	Multiple Items: Coordinated Ordering	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 13	
13	Multi-echelon Inventories	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 14	

14	Multi-echelon Inventories	1, 2,3,4	Quiz/HW	Lecture Class discussion	
15	Project Presentation	4,5	Project	Group Presentation	
	Final exam		Written Exam		

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Quizs and homeworks (15%)	60%Pass	60%Pass	60%Pass	60%Pass	100% Pass
Project (15%)	60%Pass	60%Pass	60%Pass	60%Pass	100% Pass
Midterm Exam (30%)	60%Pass	60%Pass	60%Pass	60%Pass	90% Pass
Final Exam (40%)	60%Pass	60%Pass	60%Pass	60%Pass	90% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1.Grading checklist

Grading checklist for Semester Project Report			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Part 1. Problem (25%)			
Criterion 1: Problem Statement	**10**		
Criterion 2: Objectives of Study	**5**		
Criterion 3: Scope and Limitations	**5**		
Criterion 4: Literature Review	**5**		
Part 2. Proposed System Design and Solution (40%)			
Criterion 1: Proposed System	**10**		
Criterion 2: Proposed Solution	**15**		
Criterion 3: New Contribution	**15**		
Part 3. Results and Validation (35%)			

Criterion 1: Results	**15**		
Criterion 2: Validation	**20**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	**Demonstrates complete understanding of the problem. All requirements of task are included in response**
4	**Demonstrates considerable understanding of the problem. All requirements of task are included.**
3	**Demonstrates partial understanding of the problem. Most requirements of task are included.**
2	**Demonstrates little understanding of the problem. Many requirements of task are missing.**
1	**Demonstrates no understanding of the problem.**
0	**No response/task not attempted**

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

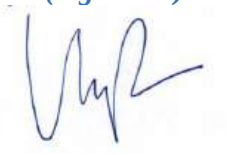
	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.

Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 04/04/2024

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: MANAGEMENT INFORMATION SYSTEMS with ENTERPRISE RESOURCES PLANNING APPLICATION

Course Code: **IS091IU**

1. General information

Course designation	***This subject will provide a broad introduction to business processes, information communication in the organizations, and systems to manage an organization's information resources. The course comes along with a computer software (SAP) to practice, through which students learn about database concepts and business processes integration, emphasizing the Internet based business models to get a competitiveness of global based business environments.***
Semester(s) in which the course is taught	**1**
Person responsible for the course	**Dr. Tran Duc Vi**
Language	**English**
Relation to curriculum	**Compulsory**
Teaching methods	**Lecture, lesson, project, lab practices.**
Workload (incl. contact hours, self-study hours)	**(Estimated) Total workload: 70** **Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45** **Private study including examination preparation, specified in hours[1]: 25**

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Credit points	**3**
Required and recommended prerequisites for joining the course	**None**
Course objectives	**Students will be provided with knowledge and skills of using software to manage different processes in the enterprise, in order to manage and plan for resources in the enterprise, and be exposed to case studies from outside the classroom. Through this unit, students will gain a deep appreciation for the role of enterprise systems in efficiently managing processes from multiple functional perspectives. Students will be able to apply the real-world concepts discussed upon entering the workforce and will be better prepared to succeed in their careers.**
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Describe the key processes in the firms supported by modern ERP systems.** **CLO2. Explain the roles of ERP systems in managing and planning resources and information system in the firm.**
Skill	**CLO3. Carry out actions to apply the concepts covered in the text to real-world situations and to the running case study used in their hands-on exercises, cooperate in group work to complete exercises.**
Attitude	**CLO4. Reason around ethical and privacy issues in information system control and apply ethical practices.**

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture and practice session

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Content**	**Weight (hour)**	**Level**
1. Introduction to Business processes and Enterprise system	- Organizational Structure - Business Processes - Enterprise Information System - Introduction to ERP SAP - SAP Logging in and Navigation	3	I
2. Sales & Distribution	- Fulfillment process and Key documents (Inquiry, Quotation, SO, PL, Customer Invoice) - Customer Relation Management	1	I, T
	SAP Lab 1: Sales and Distribution (SD) – Case Study	2	T, U
3. Production Planning	- Production strategies and process - Key documents (Planned Order, BOM, Production Order)	1	I, T
	SAP Lab 2: Production Planning (PP) – Case Study	2	T, U
4. Inventory and Warehouse Management (IWM)	- Goods movement in IM and their financial impacts - Key processes in WM	1	I, T
	SAP Lab 3: Warehouse Management (WM) and Inventory Management (IM) – Case study	2	T, U
Mini-project 1: ERP Implementation Project Management	- Introduction to Project System (PS) - Case study - **EITHER** Seminar or Corporate visit about Implementing ERP in Business **OR** Practice project planning and execution	6	I, T, U
Revision		3	
Midterm Exam			
5. Material Planning	- MRP types and process - MRP data and key documents	1	I, T
	SAP Lab 4: Material Requirement Planning (MRP) – Case study	2	T, U
6. Procurement	- Procurement process and Key documents (Purchase Requisition, PO, Vendor Invoice) - Supplier Relation Management	1	I, T
	SAP Lab 5: Purchasing (MM) – Case Study	2	T, U
7. Financial Accounting and Reporting	- Intro to Financial Accounting	2	I, T

		- Financial reporting throughout procurement process (AR/AP, SO, COGS, Invoices)		
	Mini-project 2: Integrated Processes – Global SCM	- Review Integrated end-to-end process (From SD to Accounting) - Divide groups into Buyers & Sellers in different countries - Practice executing end-to-end processes on SAP.	4	I, T, U
	Mini-project 3: ERP Business Simulation	- Introduction to ERPsim - Divide groups to play the Manufacturing, Logistics, and Retail Game (more info here)	3	I, T, U
	Project presentation	The groups present about one of the 3 mini-projects.	6	
	Review		3	
	Final Exam			
Examination forms	**Multiple-choice questions, short-answer questions**			
Study and examination requirements	**Attendance: A minimum attendance of 70 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.** **Assignments/Examination: Students must have more than 50/100 points overall to pass this course.**			
Reading list	**[1] Earl McKinney Jr. & David M. Kroenke, Proceesses, Systems, and Information, An Introduction to MIS, 2nd edition, 2015.** **[2] Magal, Simha R., and Jeffrey Word. Essentials of business processes and information systems. Wiley Publishing, 2009.** **[3] *Business Process Integration with SAP ERP*, by Magal and Word, Epistemy Press, 2013.** **[3] SAP ERP 6.0 with Global Bike Inc practice case, supported by the SAP University Alliances.**			

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-7) is shown in the following table:

	PLO/SLO						
CLO	1	2	3	4	5	6	**7**
1			x				
2			x				
3					x		
4				x			

ABET_Student Outcomes

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	1. Introduction to Management Information Sytem (MIS)	CLO 1, 2		Lecture	Reading [1] – Chap 1 & 2 Reading [2] – Chap 1 & 2
2	2. Operational Processes and Information Systems	CLO 1, 3	Homework	Lecture	SAP Curriculum
3	3. Dynamic Processes and Information Systems	CLO 1, 3	Homework	Lecture	Reading [1] – Chap 3
4	4. Procurement	CLO 1, 3	Homework Quiz	Lecture	Reading [2] – Chap 4
5-6	5. Fulfillment	CLO 1, 2, 3, 4	Homework	Lecture & Exercise & Case Study (SD)	Reading [1] – Chapter 5
7	Midterm Review	CLO 1, 2, 3, 4		In-class Discussion	
8-9	Midterm				

10	**6. Production**	**CLO 1, 3**	**Homework**	**Lecture**	**Reading [1] – Chap 6**
11	**7. Inventory and Warehouse Management**	**CLO 1, 3**	**Homework**	**Lecture**	**Reading [1] – Chap 7**
12	**8. Material Planning**	**CLO 1, 2, 3, 4**	**Quiz**	**Lecture & Exercise & Case Study (MM)**	**Reading [1] – Chap 8**
13	**9. Process Integration 1**	**CLO 1, 2, 3, 4**	**Homework**	**Lecture**	**Reading [1] – Chap 9**
14	**10. Process Integration 2**	**CLO 1, 2, 3, 4**	**Homework**	**Lecture**	**Reading [1] – Chap 9**
15-16	**Industry Presentation**	**CLO 1, 2, 3, 4**	**Presentation**	**Presentation**	
17	**Final Review**				
18	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
In-class assignment (15%) (individual)	**Quiz 60% Pass**	**Quiz 60% Pass**		
Group mini projects (15%) (Exercises & Case Study)		**Mini project 1,2,3 50% Pass**	**Mini project 1,2,3 50% Pass**	**Mini project 1,2,3 50% Pass**
Midterm exam (30%)	**Q1 50% Pass**	**Q2 50% Pass**	**Q3 50% Pass**	**Q4 50% Pass**
Final exam (40%)	**Q1 50% Pass**	**Q2 50% Pass**	**Q3 50% Pass**	**Q4 50% Pass**

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	**Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.**	**Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.**	**Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.**	**Issue/ problem to be considered critically is stated without clarification or description.**
Evidence ***Selecting and using information to investigate a point of view or conclusion***	**Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.**	**Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.**	**Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.**	**Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.**
Influence of context and assumptions	**Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.**	**Identifies own and others' assumptions and several relevant contexts when presenting a position.**	**Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).**	**Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.**
Student's position (perspective, thesis/hypothesis)	**Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.**	**Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.**
Conclusions and related outcomes (implications and consequences)	**Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.**	**Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.**	**Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.**	**Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.**

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.**
Language	**Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.**
Delivery	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.**
Supporting Material	**A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.**
Central Message	**Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)**	**Central message is clear and consistent with the supporting material.**	**Central message is basically understandable but is not often repeated and is not memorable.**	**Central message can be deduced but is not explicitly stated in the presentation.**

Source: Association of American Colleges and Universities

6. Date revised: April 19, 2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)

Associate Prof. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Lean Production

Course Code: **IS041IU**

1. General information

Course designation	This course will help students to understand the concepts and philosophies of lean, get familiar with lean tools/techniques, especially the concepts behind the tools/techniques used, and develop analytical, problem solving skills. Therefore, the students will be able to join well in most of foreign-invested enterprises or large organizations in Vietnam after graduation. Ultimately, they will be able to apply lean philosophy creatively in each unique practical situation.
Semester(s) in which the course is taught	7
Person responsible for the course	Dr. Tran Duc Vi
Language	English
Relation to curriculum	Specialization
Teaching methods	Lecture, project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (lecture):45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	None

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	1. Understand different kinds of production and the background and philosophies of lean production, analyzing existing systems and identify different kinds of waste 2. Apply approaches used in implementing lean production such as 5S, stability, pull production, cellular arrangement and layout improvement, quick change, total productive maintenance, mistake reduction, standards, leveling, visual management to real-life problems
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Understand different kinds of production and the background and philosophies of lean production.** **Understand method to analyze existing systems and identify different kinds of waste.**
Skills	**CLO2.Apply approaches used in implementing lean production such as 5S, stability, pull production, cellular arrangement and layout improvement, quick change.** **Apply for total productive maintenance, mistake reduction, standards, leveling, visual management to real-life problems.**

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	Weight	Level
Introduction to Lean Production	**1**	**I, T**
Value stream mapping	**1**	**I, T**
Process stability	**1**	**I, T**
Standardized work	**1**	**I, T**
Production smoothing	**1**	**I, T**
Cellular manufacturing	**1**	**I, T**
Adaptable Kanban system maintains JIT production	**1**	**I, T**
Determining the number of Kanban	**1**	**I, T**
How Toyota shortened production lead time	**1**	**I, T**
Autonomous defects control (Pokayoke)	**1**	**I, T**
Numerical analysis for productivity improvement	**1**	**I, T**
Implementing the TPS	**1**	**I, T**

Examination forms	Writing, project presentation
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	**Textbook:** [1] Toyota Production System: An Integrated Approach to Just-In-Time, 4th Edition, Yasuhiro Monden. **Other references:** [2] Lean thinking: Banish waste and create wealth in your corporation, James Womack & Daniel Johns, Free Press, 2003 [3] The Toyota way, Jeffrey Liker, McGraw-Hill, 2004 [4] The machine that changed the world, James Womack, Daniel Johns and Daniel Roos, Rawson Associates, 1990 [5] Lean production simplified, Pascal Dennis [6] Seeing the whole, Dan John, Jim Womark [7] Learning to see, Dan John, Jim Womark [8] Total Productive Maintenance, Steven Borris, McGraw-Hill, 2006

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-2) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	x	x				x	
2			x	x	x	x	x

Intended Learning Outcomes (*ABET_Student Outcomes)*
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a 2.2b		2.4a 2.4b	2.5a	
2	1.1a 1.1b 1.1c	1.2a	1.3a 1.3b 1.3c 1.3d		2.2b	2.3a	2.4b 2.4c	2.5a 2.5b	2.6a 2.6b

3. Planned learning activities and teaching methods

Week	Content	CLOs	Assessment	Learning Activities	Resources
1	The birth of Lean production, house of Lean production, Muda	1.1	HW	Lecture Project group forming Class Discussion Read Book	
2	Value stream mapping	1.1	HW, Midterm	Lecture Class Discussion Read Book	
3	Process stability – 5S, Toyota Productive Maintenance	1.1	HW, Midterm	Lecture Class Discussion Read Book	
4	Standardized work – takt time/ cycle time, work sequence, in-process stock Auditing standardized work	1.1	HW, Midterm	Lecture Class Discussion Read Book	
5	Production smoothing	1.1	HW, Midterm	Lecture Class Discussion Read Book	
6	Cellular manufacturing	2.1	HW, Midterm	Lecture Class Discussion Read Book	
7	Adaptable Kanban system maintains JIT production	2.1	HW, Midterm	Lecture Class Discussion Read Book	
8	Review for Midterm		Quiz	Class Discussion Problem solving	
9	Midterm Exam				
10	Determining the number of Kanban	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	
11	How Toyota shortened production lead time	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	

12	Autonomous defects control (Pokayoke)	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	
13	Numerical analysis for productivity improvement	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	
14	Implementing the TPS	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	
15	Presentation	2.1, 2.2, 3	Project	Presentation Class Discussion	
16	Review for Final				
17	Final Examination				

4. Assessment plan

Assessment Type	CLO1	CLO2
Project (15%)	x	x
Homework, quiz (15%)		x
Midterm exam (30%)	x	x
Final exam (40%)	x	x

Note: %Pass: Target 70% of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		

Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 11 April 2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Quality Management

Course Code: **IS025IU**

1. General information

Course designation	*Introduction to the principles of quality management, with an emphasis on cross-functional problem solving. This course will provide a basic understanding of the philosophy, conceptual frameworks, and the tools of the Total Quality Management.*
Semester(s) in which the course is taught	1, 2
Person responsible for the course	M.Sc. Duong Vo Nhi Anh
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	Nil

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Course objectives</td><td>Understand different kinds of quality tools, PDCA, …
Apply quality tools in problem solving, quality improvement to reduce cost, quality of products</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO 1. Understand different kinds of quality and the background and philosophies of quality
CLO 2. Understand method to analyze existing problem and identify different kinds of solutions</td></tr>
<tr><td>Skill</td><td>CLO 3. Apply approaches used in implementing quality tools</td></tr>
<tr><td>Attitude</td><td>CLO 4. Apply for improve standards, quality of products</td></tr>
</table></td></tr>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (3 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Introduction to Quality Management</td><td>1</td><td>I, T</td></tr>
<tr><td>Why Total Quality Management Definitions and basic principles</td><td>2</td><td>T, U</td></tr>
<tr><td>Quality Control: Measuring and process analysis</td><td>1</td><td>T, U</td></tr>
<tr><td>Quality Improvement & Problem Solving Method-SCRA</td><td>2</td><td>T</td></tr>
<tr><td>Quality tools: ISO, …</td><td>2</td><td>T, U</td></tr>
<tr><td>SPC/SQC: control charts</td><td>2</td><td>T</td></tr>
<tr><td>Stabilizing and improving a process with control charts</td><td>1</td><td>T, U</td></tr>
<tr><td>Variables and attribute control charts</td><td>1</td><td>T, U</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Multiple-choice questions, short-answer questions</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
</table>

Reading list	[1] D.L. Goetsch and Stanley B. Davis, Quality Management- 5th edition, Prentice Hall, 2006. [2] Howard S. Gitlow et. al., Quality Management - 3rd edition, McGraw Hill, 200 [3] Evans, Managing for quality and performance excellence -7th edition, Cengage Learning. [4] Winston, Operations Research – 4th edition, Cengage Learning. [5] Barry Render, Quantitative analysis for management - 9th edition, Prentice Hall, 2006

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

		ILO					
CLO	1	2	3	4	5	6	7
1	x						
2	x	x	x				
3						x	
4				x			x

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2	1.1c	1.2a 1.2b	1.3a 1.3c 1.3d	2.1a 2.1b	2.2a		2.4a	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4	1.1a 1.1b 1.1c		1.3c			2.3a	2.4c	2.5b	2.6b

3. Planned learning activities and teaching methods

Week	Topic	CLOs	Assessment	Learning activities
1	Introduction to Quality Management Fundamentals of quality: process basics, types of quality, relationship between quality and cost and productivity.	CLO 1, 2	- Quiz	- Group forming. - Class discussion - Read book & lecture 2.
2	Why Total Quality Management Definitions and basic principles How to realize TQM: three components of TQM, quality and global competitiveness, environment of today. Why Total Quality Management in a Knowledge-Based Economy? Breaking out of the negative circle	CLO 1, 2	- Quiz - Homework	- Class discussion - Read book & lecture 3.
3	Introducing the Three Pillars of TQM Quality Planning:	CLO 1, 2	- Quiz /HW	- Class discussion - Read book & lecture 4.
4	Behavioral Component of TQM Establishing a quality culture, conditions for a successful TQM policy, increasing the quality of cooperation processes, TQM & the strategy of change, How can the behavioral component be developed?	CLO 1, 2	- Quiz /HW	- Class discussion - Read book & lecture 4.
5	Management components of TQM: Role of Top Management/ Task-oriented meetings. Roadmap to business excellence	CLO 1, 2	- Homework	- Class discussion - Read book & lecture 5.
6	Technical components of TQM: Quality Systems and Quality Assurance Quality tools: ISO, … .	CLO 1, 2	- Quiz /HW	- Class discussion - Read book & lecture 6.

7	Review	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 6.
8	Technical components of TQM (cont) ISO and other statistical tools. Collection and presentation of data	CLO 1, 2, 3	- Quiz /HW	- Class discussion
	Midterm exam			
9	SPC/SQC: control charts Stabilizing and improving a process with control charts. Variables and attribute control charts. How to read a control chard: 7 rules.	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture7.
10	SPC/SQC: control charts Stabilizing and improving a process with control charts. Variables and attribute control charts. How to read a control chard: 7 rules.	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 8.
11	SPC/SQC: control charts Stabilizing and improving a process with control charts. Variables and attribute control charts. How to read a control chard: 7 rules.	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 8.
12	Standard Operating	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book &
	Procedures (SOP) Quality Function Deployment (QFD)			lecture 8.
13	Standard Operating Procedures (SOP) Quality Function Deployment (QFD)	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 9.
14	Group presentation	CLO 1, 2, 3, 4	- Quiz /HW	- Class discussion
15	Review for Final Exam	CLO 1, 2, 3, 4	- Quiz /HW	- Class discussion
	Final Examination			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quizzes and homework (15%)	60%Pass	60%Pass	60%Pass	60%Pass
Project (15%)	60%Pass	60%Pass	60%Pass	60%Pass
Midterm Exam (30%)	60%Pass	60%Pass	60%Pass	60%Pass
Final Exam (40%)	60%Pass	60%Pass	60%Pass	60%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 12, 2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Project Management

Course Code: **IS026IU**

1. General information

Course designation	This course is developed to provide the principal concept on project management which was characterized by the project management body of knowledge guide (PMBOK Guide). This guide emphasizes the five project process groups of initiating, planning, executing, controlling and closing, and the nine knowledge areas of project integration, scope, time, cost, quality, human resources, communication, risk, and procurement management.
Semester(s) in which the course is taught	4
Person responsible for the course	Tran Van Ly
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, homework.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, etc.): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	None
Course objectives	Students will be provided with knowledge and skills of constructing the network (AON & AOA), GANNT Chart, solving the network; Resource allocation, resource loading & levelling; Project budgeting & cost estimation, risk management; Project quality management; Project human resource management; Project procurement management; Project executing, monitoring & control to closing the project
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Able to align the project to the organization's strategic plans and business justification throughout its lifecycle; to identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders.** **CLO2. Able to manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders** **Able to implement general business concepts, practices, and tools to facilitate project success.**
Skill	**CLO3. Work effectively in group projects in a specific context; combining the techniques to conduct practical cases. Respond to the needs of community and industrial sectors**
Attitude	**CLO4. Able to apply appropriate legal and ethical standards.** **Adapt project management practices to meet the needs of stakeholders from multiple sectors of the economy (i.e. consulting, government, arts, media, and charity organizations); Identify and follow strictly ethical disciplines in project management**

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Lecture 1: Introduction to Project Management	**1**	**I, T**
Lecture 2: Project management processes for a project	**1**	**I, T**
Lecture 3: Work breakdown structure	**1**	**I, T**
Lecture 4: Project scheduling	**1**	**I, T**
Lecture 5: Resource allocation	**1**	**I, T**
Lecture 6: Logical Framework	**2**	**I, T**
Lecture 7: Project cost management	**1**	**I, T**
Lecture 8: Project risk management	**1**	**I, T**
Lecture 9: Project quality management	**1**	**I, T**
Lecture 10: Project human resource management	**1**	**I, T**
Lecture 11: Project procurement management	**1**	**I, T**
Lecture 12: Project executing, monitoring & control.	**1**	**I, T**
Lecture 13: Project closing	**1**	**I, T**

Examination forms	Short-answer questions, exercises
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	[1] Book name: A Guide to the project management body of knowledge (PMBOK® Guide). 5th Edition, Newtown Square, Pa. : Project Management Institute, Inc. [2] Project management: A managerial approach / Jack R. Meredith, Samuel J. Mantel. 7th Edition, Hoboken, N.J. : Wiley ; Chichester : John Wiley [distributor], 2009. [3] The project management life cycle/ Jason West land. Kogan Page Limited, 2006

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1		x					
2		x					
3						x	
4				x			

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4	1.1b		1.3c					2.5b	2.6b

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Lecture 1: Introduction to Project Management, project life cycle and organization	1 1.2.b		Lecture, Group work	[1].
2	Lecture 2: Project management processes for a project - Common project management process interactions. - Project management process groups. - Initiating process group	1 1.2.b	HW 1	Lecture, Group work	[1].

	- Planning process group				
3	Lecture 3: Work breakdown structure	1,3,4 1.2.b 1.2.a/1.3.d	HW 2	Lecture, Group work	[1].
4	Lecture 4: Project scheduling. - Constructing the network: AON & AOA - Gantt chart - Solving the network - Using Microsoft Project software	1,3,4 1.2.b 1.2.a/1.3.d	HW 3	Lecture, Group work	[1].
5	Lecture 5: Resource allocation - Critical path method – Crashing a project - Resource allocation problem - Resource loading - Resource leveling - Constrained resource scheduling	1,3,4 1.2.b 1.2.a/1.3.d 1.1.b	HW 4	Lecture, Group work	[1].
6 & 7	Lecture 6: Logical Framework Approach (LFA)	3 1.2.a/1.3.d		Lecture, Group work	[1].
8	Review for Midterm				
	Midterm				
9	Lecture 7: Project cost management Project budgeting & Cost estimation - Top-Down budgeting - Bottom-Up budgeting - Improving the process of cost estimation	2, 3, 4 2.5a 1.2.a/1.3.d 1.1.b	HW 5	Lecture, Group work	[1].
10	Lecture 8: Risk management. - Risk management planning - Risk identification - Risk analysis - Risk monitoring and control - Using Crystal Ball software	2, 3, 4 2.5a 1.2.a/1.3.d 1.1.b	HW 6	Lecture, Group work	
11	Lecture 9: Project quality management - Plan quality - Perform quality assurance - Perform quality control	2, 3, 4 2.5a 1.2.a/1.3.d 1.1.b	HW 7	Lecture, Group work	[1].
12	Lecture 10: Project human resource management - Develop human resource plan - Acquire project team - Develop project team - Manage project team	2, 3, 4 2.5a 1.2.a/1.3.d 1.1.b	HW 8	Lecture, Group work	[1].
13	Lecture 11: Project procurement management - Plan procurements - Conduct procurements - Administer procurements	2, 3, 4 2.5a 1.2.a/1.3.d	HW 9	Lecture, Group work	[1].

	- Close procurements	1.1.b			
14	Lecture 12: Project executing, monitoring & control.	2, 3, 4 2.5a	HW 10	Lecture, Group work	[1].
15	Lecture 13: Project closing Project Presentation Review for Final Exam	2, 3, 4 2.5a 1.2.a/1.3.d 1.1.b		Problems solving Group work	[1].
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Homework exercises (30%)	HW1-2 50%Pass	HW4, HW5, HW6 50%Pass	HW7-8 50%Pass	HW9-10 50%Pass
Midterm exam (30%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	
Final exam (40%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		

Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

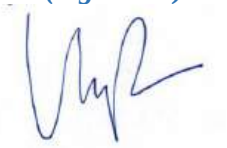
Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. **Date revised: April 12, 2024**

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: TIME SERIES AND FORECASTING TECHNIQUES

Course Code: **IS104IU**

1. General information

Course designation	**It provides an overview of fundamental concepts:** **i. The formulation and specification of forecasting models;** **ii. data collection, interpretation, organization, and analysis for building forecasting models;** **iii. fundamental statistical and probability concepts used in forecasting;** **iv. the existence of a hierarchy of forecasting models;**
Semester(s) in which the course is taught	**1**
Person responsible for the course	***Dr. Ha Thi Xuan Chi***
Language	**English**
Relation to curriculum	***Compulsory***
Teaching methods	***Lecture, lesson, project***
Workload (incl. contact hours, self-study hours)	***(Estimated) Total workload:*** ***Contact hours (please specify whether lecture, exercise, laboratory session, etc.):*** ***Private study including examination preparation, specified in hours[1]:***
Credit points	**3**

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	**Engineering Probability & Statistics** **Production and Operations Management**
Course objectives	**The general objectives for this course are to** ▪ **Provide students with an introduction to the importance and use of economic forecasting to reduce uncertainty;** ▪ **Provide students with an understanding of data analysis applicable to developing economic forecasts;** ▪ **Provide students with an understanding of forecasting error metrics;** ▪ **Provide students with the basics of economic forecasting methods and models;** ▪ **Expose students to the use of a computer package for developing forecasting models;** ▪ **Allow students to apply the techniques learned in the course to lab assignments;** ▪ **Make policy recommendations (private and public) based on rational forecasts.**
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	Course learning outcome (CLO)
Knowledge	**CLO1. Students are able to use and identify different methods of forecast error measures,** **CLO2. Students are able to identify, discuss features of appropriate forecasting models, and choose the most suitable methods and correct implementation** **CLO3. Students have Engineering and Scientific knowledge to manipulate the mathematical and statistical properties of classes of forecasting models.**
Skill	**CLO4. Students are able to do literature review, drafting and conduction of experiments, interpretation of data, manipulate features of computer packages and computer simulations.**
Attitude	

Content	***The description of the contents should clearly indicate the weighting of the content and the level.*** **Weight: lecture session (3 hours)** **Teaching levels: I (Introduce); T (Teach); U (Utilize)**

Topic	Weight	Level	
Introduction to Forecasting	1	I, T	
Review of Basic Statistical Concepts	2	T, U	
Data Patterns and Forecasting Techniques	1	T, U	
Moving Averages and Smoothing Methods	2	T, U	
Time-Series and Their Components	2	T, U	
Introduction to Forecasting	2	I, T	
Review of Basic Statistical Concepts	1	T, U	
Box-Jenkins (ARIMA) Type	0.5	T, U	
Forecasting Models		T, U	
Simple Linear Regression Multiple Regression Analysis/Time Series		T, U	

Examination forms	**Written Exam**
Study and examination requirements	**Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.** **Assignments/Examination: Students must have more than 50/100 points overall to pass this course.**
Reading list	**Textbooks:** **Introduction to Time Series and Forecasting, Montgomery et al., Publisher: J. Wiley & Sons**

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

	ILO						
CLO	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	**x**						
2	**x**						
3	**x**						**x**
4						**x**	**x**

Intended Learning Outcomes

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	**1.1**	**1.2**	**1.3**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**
1		**1.2a** **1.2b**	**1.3d**	**2.1a** **2.1b**	**2.2a**				
2		**1.2a** **1.2b**	**1.3d**	**2.1a** **2.1b**	**2.2a**				
3	**1.1a** **1.1b** **1.1c**	**1.2a** **1.2b**	**1.3c** **1.3d**	**2.1a** **2.1b**	**2.2a**	**2.3a**	**2.4c**		
4	**1.1a** **1.1b** **1.1c**	**1.2a** **1.2b**	**1.3c** **1.3d**	**2.1a** **2.1b**	**2.2a** **2.2b**	**2.3a**	**2.4b** **2.4c**	**2.5a**	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Forecasting	2	Quiz 1	Lecture Class discussion Quiz	
2	Review of Basic Statistical Concepts	2	HW1	Lecture Class discussion HW	
3&4	Data Patterns and Forecasting Techniques	2	Quiz 2 HW2	Lecture Class discussion HW, Quiz	
5&6	Moving Averages and Smoothing Methods	1, 2	HW3	Lecture Class discussion HW	
7	Time-Series and Their Components	1, 2, 3	HW4,	Lecture Class discussion HW	
8	Review			Lecture Class discussion	
	Midterm exam				
9	Simple Linear Regression	1, 2, 3		Lecture, Class discussion	
10	Multiple Regression Analysis	1, 2, 3		Lecture, Class discussion	
11&12&13	Box-Jenkins (ARIMA) Methodology	1, 2, 3		Lecture, Class discussion	
14	Forecasting Models	1, 2, 3		Lecture, Class discussion	
15	Review				
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Homework exercise /quizzes (15%)	HW3, HW4. HW5 60%Pass	HW1, HW2, HW4 60%Pass Quiz 1, Quiz 2 60%Pass	HW4, HW5 HW6, HW7 60%Pass Quiz 3, Quiz 4 60%Pass	HW4. HW6, HW7 60%Pass Quiz 3, Quiz 4 60%Pass
Group Project (15%)	Group Project 60%Pass		Group Project 60%Pass	
Midterm (30%)	60% Pass	60% Pass	60% Pass	
Final (40%)	60% Pass	60% Pass	60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. Date: …… Evaluator: ……..			
	Max.	Score	Comments
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion …:			
Part 2….. (….%)			
Criterion 1 …:			
Criterion …:			
Part 3….. (….%)			
Criterion 1…:			
Criterion …:			
Part ….. (….%)			
TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	**Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.**	**Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.**	**Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.**	**Issue/ problem to be considered critically is stated without clarification or description.**
Evidence ***Selecting and using information to investigate a point of view or conclusion***	**Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.**	**Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.**	**Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.**	**Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.**
Influence of context and assumptions	**Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.**	**Identifies own and others' assumptions and several relevant contexts when presenting a position.**	**Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).**	**Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.**

Student's position (perspective, thesis/hypothesis)	**Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.**	**Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.**
Conclusions and related outcomes (implications and consequences)	**Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.**	**Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.**	**Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.**	**Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.**

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

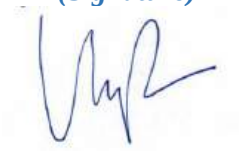
	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.**
Language	**Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.**
Delivery	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.**

Supporting Material	**A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.**
Central Message	**Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)**	**Central message is clear and consistent with the supporting material.**	**Central message is basically understandable but is not often repeated and is not memorable.**	**Central message can be deduced but is not explicitly stated in the presentation.**

Source: Association of American Colleges and Universities

6. Date revised: 10/ 04/ 2024

Ho Chi Minh City, 26 / 04 / 2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Experimental Design

Course Code: **IS031IU**

1. General information

Course designation	Statistical design of experiments refers to the process of planning the experiment so that appropriate data will be collected and analyzed by statistical methods, resulting in valid and objective conclusions. A well designed experiment not only reveals. important information of a process or system, but is also cost efficient. This applied statistic course benefits tremendously for both engineers and researchers in many activities such as new product design, manufacturing process development and process improvement. Coverage includes factorial, fractional factorial experimental designs, blocking and confounding factors, regression modeling and response surface methodology.
Semester(s) in which the course is taught	7
Person responsible for the course	Dr. Pham Huynh Tram
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, project

Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (lecture):45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	Engineering Probability and Statistics
Course objectives	Students are able to design experiments to test a hypothesis, analyze and interpret data
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Understand basic concepts of experimentation**
Knowledge	**CLO2. Understand different types of experimental designs and their usages**
Skill	**CLO3. Able to plan different types of experimental designs**
Knowledge	**CLO4. Able to apply knowledge of statistics to analyse experimental results**

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	Weight	Level
Introduction to Design of Experiments ***Strategy, applications, guidelines and basic principles***	**1**	**I**
Review of Basic Statistical Methods ***Sampling*** ***Inferences about the differences in means*** ***Inferences about the variances of normal distribution***	**1**	**I**
Analysis of Variance ***Single-factor analysis of variance Model adequacy checking Interpreting of the results*** ***Sample computer output*** ***Determining sample size Dispersion effects Regression approach*** ***Real economy application of a designed experiment***	**1**	**I**
Experiments with Blocking Factors ***Randomized block*** ***Latin square design*** ***Incomplete block designs***	**2**	**T,U**
Factorial Experiments ***Basic definitions and principles*** ***Two factors factorial design*** ***Blocking in factorial experiments***	**1**	**T, U**
Two-level Factorial Designs ***The 2^2 design, the 2^3 design*** ***The general 2^k design*** ***Single replicate of the 2^k design***	**1**	**T,U**
Factorial Experiments ***Basic definitions and principles*** ***Two factors factorial design*** ***Blocking in factorial experiments***	**1**	**T, U**

	Two-level Factorial Designs ***The 2^2 design, the 2^3 design*** ***The general 2^k design*** ***Single replicate of the 2^k design***	**2**	**T, U**
	Two-level Fractional Factorial Designs ***One-half fraction of the 2^k design*** ***One quarter fraction of the 2^k design*** ***Blocking fractional factorials***	**2**	**T,U**
	Regression Modeling ***Linear regression models Estimation of the parameters Hypothesis testing of the parameters***	**1**	**I**
	Response Surface Methodology ***Method of steepest ascent*** ***Analysis of a second-order response surface*** ***Application to robust design***	**2**	**I**
Examination forms	Writing, project presentation		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	[1] D.C. Montgomery, Design and Analysis of Experiments, 7th ed., Wiley, 2009.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	SLO						
CLO	1	2	3	4	5	6	7
1						x	
2						x	
3						x	
4						x	

Intended Learning Outcomes

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*

2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a	1.3d		2.2b		2.4b	2.5a	
2		1.2a	1.3d		2.2b		2.4b	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4		1.2a	1.3d		2.2b		2.4b	2.5a	

3. Planned learning activities and teaching methods

Week	Topic	**CLOs**	**Assessment Activities**	**Resources**
1	Introduction to Design of Experiments *Strategy, applications, guidelines and basic principles*	1	HW Midterm	[1].1
2	Review of Basic Statistical Methods *Sampling* *Inferences about the differences in means* *Inferences about the variances of normal distribution*	4	HW Midterm	[1].2
3	Analysis of Variance *Single-factor analysis of variance Model adequacy checking Interpreting of the results* *Sample computer output* *Determining sample size Dispersion effects Regression approach* *Real economy application of a designed experiment*	4	HW Midterm	[1].3
4 **&5**	Experiments with Blocking Factors *Randomized block* *Latin square design* *Incomplete block designs*	2 3 4	HW Midterm	[1].4

6	Factorial Experiments *Basic definitions and principles* *Two factors factorial design* *Blocking in factorial experiments*	2 3 4	HW Midterm	[1].5
7	Two-level Factorial Designs *The 2^2 design, the 2^3 design* *The general 2^k design* *Single replicate of the 2^k design*	2 3 4	HW Midterm	[1].6
MIDTERM EXAMINATION				
8	Two-level Factorial Designs (cont) *Addition of center points to the 2^kdesign* *Blocking a replicated 2^k design* *Confounding in the 2^k design*		HW Final	[1].7
9&10	Two-level Fractional Factorial Designs *One-half fraction of the 2^k design* *One quarter fraction of the 2^k design* *Blocking fractional factorials*	2 3 4	HW Final	[1].8
11	Regression Modeling *Linear regression models Estimation of the parameters Hypothesis testing of the parameters*	2 3 4	HW Final	[1].10
12&13	Response Surface Methodology *Method of steepest ascent* *Analysis of a second-order response surface* *Application to robust design*	2 3 4	HW Final	[1].11
14	Group presentation			
15	Review for final			
FINAL EXAMINATION				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Project (20%)	x	x	x	x
Homework (10%)	x	x		x
Midterm exam (30%)	x	x		x
Final exam (40%)	x	x		x

Note: %Pass: Target 70% of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: …….			
Date: …… Evaluator: ……			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

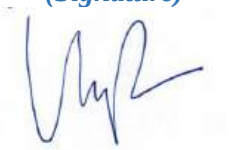
Source: Association of American Colleges and Universities

6. Date revised: 12/04/2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: MULTI-CRITERIA DECISION MAKING

Course Code: **IS033IU**

1. General information

Course designation	**This course provides basic concepts, tools and techniques of decision making for solving complex problems in production, services, and daily life. This course includes two parts: multi-attribute decision making (MADM) and multi-objective decision making (MODM).**
Semester(s) in which the course is taught	**1**
Person responsible for the course	***Dr. Ha Thi Xuan Chi***
Language	**English**
Relation to curriculum	***Compulsory***
Teaching methods	***Lecture, lesson, project***
Workload (incl. contact hours, self-study hours)	**(Estimated) Total workload: 70** **Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45** **Private study including examination preparation, specified in hours[1]: 25**
Credit points	**3**

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	
Course objectives	**Decision making is one of the important parts in operations research or management science. Decision making techniques help managers choose the best alternative based on quantitative and qualitative criteria or find the optimal solutions under many conflicts of objectives. Output analysis is also considered to draw inference of the actual problems. This course provides basic concepts, tools and techniques of decision making for solving complex problems in production, services, and daily life. This course includes two parts: multi-attribute decision making (MADM) and multi-objective decision making (MODM).**
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	Course learning outcome (CLO)
Knowledge	**CLO1. Able to build the procedure for decision making** **CLO2. Able to recognize MADM and MODM techniques** **CLO3. Able to model problems by using MADM techniques** **CLO4. Able to apply knowledge of deterministic models in operation research to formulate MODM models** **CLO5. Able to solve MODM problems by using MODM techniques** **CLO6. Able to read and interpret the solutions** **CLO7. Able to redesign the models to meet the requirements**
Skill	**CLO8. Able to use Expert Choice software as a tool to solve AHP technique**
Attitude	

<table>
<tr><td>Content</td><td>

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	Weight	Level
Introduction to MCDM	1	I, T
Introduction to Multi-Attribute Decision Making Techniques: Simple Addictive Weight Technique, TOPSIS	2	T, U
Analytic Hierarchy Process	1	T, U
Introduce to Expert choice software to solve Analytic Hierarchy Process problems	2	T, U
Fuzzy AHP	2	T, U
Introduction to Multi-Objective Decision Making	2	I, T
Minimum Deviation and Compromise Programming	1	T, U
Goal Programming	0.5	T, U
De Novo Technique	0.5	T, U

</td></tr>
<tr><td>Examination forms</td><td>

Written Exam

</td></tr>
<tr><td>Study and examination requirements</td><td>

Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Assignments/Examination: Students must have more than 50/100 points overall to pass this course.

</td></tr>
<tr><td>Reading list</td><td>

Textbooks:

[1] "Multiple Attribute Decision Making: Methods and applications". Gwo-Hshiung Tzeng & Jih-Jeng Huang, CRC Press, Taylor & Francis Group, 2011 by Taylor & Francis Group.

References:

[2] Milan Zeleny, Multiple Criteria Decision Making, McGraw-Hill, 1982.

Software:

Expert choice

</td></tr>
</table>

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-…) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	**x**						
2	**x**						
3	**x**	**x**					
4	**x**	**x**					
5	**x**	**x**					
6	**x**	**x**					
7						**x**	
8						**x**	

Intended Learning Outcomes

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	**1.1**	**1.2**	**1.3**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**
1		**1.2a** **1.2b**	**1.3d**	**2.1a** **2.1b**	**2.2a**				

2		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
3		1.2a 1.2b	1.3d 1.3c	2.1a, 2.1b	2.2a		2.4a	2.5a	
4		1.2a 1.2b	1.3d 1.3c	2.1a, 2.1b	2.2a		2.4a	2.5a	
5		1.2a 1.2b	1.3c 1.3d	2.1a 2.1b	2.2a		2.4a	2.5a	
6		1.2a 1.2b	1.3c 1.3d	2.1a 2.1b	2.2a		2.4a	2.5a	
7		1.2a	1.3d		2.2b		2.4b	2.5a	
8		1.2a	1.3d		2.2b		2.4b	2.5a	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to MCDM	1, 2		Lecture	
2	Introduction to Multi-Attribute Decision Making Techniques: Simple Addictive Weight Technique, TOPSIS	2, 6, 7	HW1	Lecture Think pair-share HW	
3	Analytic Hierarchy Process	3, 6, 7	HW2	Lecture Think pair-share HW	
4&5	Introduce to Expert choice software to solve Analytic Hierarchy Process problems	3, 6, 7	HW3, Exam	Lecture Think pair-share HW	
6	Fuzzy AHP	2, 6, 7	HW4, Exam	Lecture, Class discussion and practice	
7	ELECTRE technique	2, 6, 7	HW5, Exam	Lecture, Class discussion and practice	

8	Review	2, 3, 6, 7	HW6, Exam	Lecture, Class discussion and practice	
9	Midterm exam				
10	Introduction to Multi-Objective Decision Making	4	Quiz 1	Lecture, Class discussion, Quiz	
11	Minimum Deviation and Compromise Programming	4, 5, 6, 7	Semester Project	Lecture, Class discussion, Group Project	
12	Goal Programming	4, 5, 6, 7	HW7, Exam	Lecture, Class discussion HW	
13	De Novo Technique	4, 5, 6, 7	HW8, Exam	Lecture, Class discussion, HW	
14	Review			Lecture	
15	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Homework exercise /quizzes (15%)	... ...%Pass	HW1 60%% Pass HW4, HW5 60% Pass	HW2 60%Pass HW3, HW6 60% Pass	Quiz 1 60%Pass HW7, HW8 60%Pass	HW7, HW8 60%Pass	HW1 60% %Pass HW2, HW3, HW4, HW5 60% Pass HW7, HW8 60%Pass	HW1 60% %Pass HW2, HW3, HW4, HW5 60% Pass HW7, HW8 60%Pass	
Group Project (15%)	60%Pass	60%Pass		Group Project 60%Pass	Group Project 60%Pass	Group Project 60%Pass	Group Project 60%Pass	
Midterm (30%)	60%Pass	60%Pass	60%Pass	60%Pass				
Final (40%)	60%Pass	60%Pass	60%Pass	60%Pass				

Note: %Pass: Target that 60% of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: …….. Date: …… Evaluator: ……			
	Max.	Score	Comments
Technical content (80%)			
Problem Identification: Be able to identify the objective(s), alternative(s) and criteria in the Industrial Engineering and Management field.	20		
Data collection and software usage: Know how to transform the data into the proper form and solve the models using computer-based software such as Expert Choice, Excel,..	20		
Methodology: Know how to apply proper decision-making techniques to solve the problem.	20		
Solution and Implementations: Be able to implement the solution in practices and do the output analysis.	20		
Report writing and Presentation (20%)			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.

1	**Demonstrates no understanding of the problem.**
0	**No response/task not attempted**

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	**Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.**	**Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.**	**Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.**	**Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.**

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

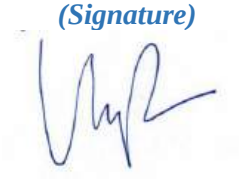
	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.**
Language	**Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.**
Delivery	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.**
Supporting Material	**A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.**
Central Message	**Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly**	**Central message is clear and consistent with the supporting material.**	**Central message is basically understandable but is not often repeated and is not memorable.**	**Central message can be deduced but is not explicitly stated in the presentation.**

	supported.)			

Source: Association of American Colleges and Universities

6. Date revised: 10/ 04/ 2024

Ho Chi Minh City, 26/ 04/ 2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Facility Layout

Course Code: **IS032IU**

1. General information

Course designation	**This course focuses on the fundamentals of the design, layout, and location of industrial and non manufacturing facilities. Selection of machines and material handling equipment and their efficient arrangement. Emphasis on quantitative methods. Warehouse layout. Facility location theory**
Semester(s) in which the course is taught	**5**
Person responsible for the course	**Dr. Dao Vu Truong Son**
Language	**English**
Relation to curriculum	**Compulsory**
Teaching methods	**Lecture, Exercises, Assignment**
Workload (incl. contact hours, self-study hours)	**(Estimated) Total workload: 70** **Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45** **Private study including examination preparation, specified in hours[1]: 25**
Credit points	**3**

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	**Nil**
Course objectives	**Understand the fundamentals of the design, layout, and location of industrial and nonmanufacturing facilities. Selection of machines and material handling equipment and their efficient arrangement. Emphasis on quantitative methods. Warehouse layout. Facility location theory**
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	Course learning outcome (CLO)
Knowledge	CLO1. Understand the fundamental and advanced concepts in the design, layout, and location of industrial and nonmanufacturing facilities. CLO2. Know how to select machines and material handling equipment and their efficient arrangement.
Skill	CLO3. Use Excel to solve facility location problems
Attitude	CLO4. Students will have positive attitude in both self-learning and group project with other disciplines related to port planning and design, especially solving related problems.

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	Weight	Level
Introduction to Facilities Planning.	3	I, T
Product and Process Design	6	I, T
Flow systems, activity relationships, and space requirement	6	I, T
Plant Layout, Inspection Systems in Design	6	T, U
Manufacturing & warehouse operations and material handling systems	6	T, U
Single & Multi-Facility Location models	3	T, U
Machine Layout Models	3	T, U
Warehouse and Order Picking Systems	3	T, U

Examination forms	**Practice, Writing questions**
Study and examination requirements	**Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.** **Assignments/Examination: Students must have more than 50/100 points overall to pass this course.**
Reading list	**[1] Tompkins, J.A., White, J.A., et al., (2010), Facilities Planning, 4th Edition, John Wiley and Sons.** **[2] R.L., Francis, L. F., McGinnis, J.A., White, (1992), Facility Layout and Location: an Analytical Approach, 2nd edition, Prentice-Hall, Inc., Englewood Cliffs, N.J.**

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-6) is shown in the following table:

	ILO						
CLO	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	**x**						
2		**x**					
3			**x**	**x**			
4					**x**	**x**	

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3	1.1b 1.1c		1.3a 1.3c					2.5b	2.6a 2.6b
4	1.1c	1.2a	1.3b 1.3d		2.2b		2.4b	2.a	2.6a

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Facilities Planning.	1		Lecture, Discussion,	[1].1 [2]
2,3	Product and Process Design.	1, 2	Exercises	Lecture, Discussion	[1].2-3
4, 5	Flow systems, activity relationships, and space requirement	2,3	Exercises	Lecture, Discussion, HW Inclass-Quiz	[1] 4,5 [2]
6, 7	Plant Layout, Inspection Systems in Design	2,3	Exercises	Lecture, Discussion, HW Inclass-Quiz	[1]. 2,3, 6, 7, 9 [2]. 2
8	Review	2	Exercises		
9	Midterm				
10,11	Manufacturing & warehouse operations and material handling systems	4	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1]. 9
12	Single & Multi-Facility Location models	3, 4	Exercises, HW, Quiz	Lecture, Discussion, Inclass-Quiz	[1]. 10
13	Machine Layout Models	3, 4	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 22 [2]. 8
14	Warehouse and Order Picking Systems	3	Exercises	Lecture,	[1] 21 [2] 9
15	Project Presentation	3,4			
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class assignment (10%)	HW 1 60% Pass	HW2 60% Pass	HW3-HW4 60% Pass	
Group projects (20%)				Group project 80% Pass
Midterm exam (30%)	60% Pass	60% Pass		
Final exam (40%)		60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: …….. Date: …… Evaluator: ……..			
	Max.	Score	Comments
Technical content (65%)			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	35		
Summary and conclusions appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
Presentation (20%)			

Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (5%)	**05**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	**Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.**	**Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.**	**Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.**	**Issue/ problem to be considered critically is stated without clarification or description.**
Evidence ***Selecting and using information to investigate a point of view or conclusion***	**Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.**	**Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.**	**Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.**	**Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.**
Influence of context and assumptions	**Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.**	**Identifies own and others' assumptions and several relevant contexts when presenting a position.**	**Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or**	**Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when**

			vice versa).	presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

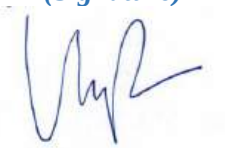
	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.

Supporting Material	**A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.**
Central Message	**Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)**	**Central message is clear and consistent with the supporting material.**	**Central message is basically understandable but is not often repeated and is not memorable.**	**Central message can be deduced but is not explicitly stated in the presentation.**

Source: Association of American Colleges and Universities

6. Date revised: April 15, 2024

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Advanced Big Data Analytics and AI applications for Industry and Supply Chain

Course Code: **IS096IU**

1. General information

Course designation	This course provides an in-depth and practical understanding of advanced big data analytics and artificial intelligence (AI) applications in industrial and supply chain domains. Students will engage in hands-on projects focusing on data visualization, predictive analytics, optimization, and decision-making using large-scale industrial data. Emphasis is placed on how AI and big data technologies support operational efficiency, supply chain resilience, smart manufacturing, and logistics innovation across various sectors.
Semester(s) in which the course is taught	8
Person responsible for the course	
Language	English
Relation to curriculum	
Teaching methods	Lecture, lesson, assignment
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 lecture hours. Private study including examination preparation, specified in hours[1]: 25 hours for project presentation
Credit points	3 credits (5 ECTS).
Required and recommended prerequisites for joining the course	Engineering Probability & Statistics
Course objectives	This course is designed to produce engineers and professionals with advanced expertise in big data analytics and AI applications tailored to industrial and supply chain systems. Students will utilize modern tools and techniques to extract insights and present knowledge related to operations, supply chains, production quality, predictive maintenance, and logistics optimization. The course aims to foster a data-driven culture by empowering students to apply intelligent data analytics in real-world industrial and logistics decision-making environments.

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	Course learning outcome (CLO)
Knowledge	CLO1. Develop a concept of Advanced Big Data Analytics and AI applications for Industry and Supply Chain
Skill	CLO2. Know how to identify and solve different Industry and Supply Chain problems by using Advanced Big Data Analytics and AI applications. CLO3. Students are able to solve practical problems, conduct detailed research, conduct experiments and analyze the solutions by applying methods of Advanced Big Data Analytics and AI applications.
Attitude	CLO4. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issue in the working environment.

Content

The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (3 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	Weight	Level
The concepts of Advanced Big Data and AI applications	**1**	**I, T**
The importance and value of data	**2**	**I, T**
Models utilizing techniques of data mining and predictive analytics to produce desired outcomes	**2**	**I, T**
Design visualizations to explain key outcomes	**2**	**T, U**
Model outcomes for quality	**2**	**T, U**
Tools and AI applications for performing data analytics	**2**	**T, U**
K-Nearest Neighbor Predictive Models, Decision Tree Predictive Models; Random Forests	**2**	**T, U**
Linear Regression for continual data modeling	**2**	**T, U**
Analysis by using Prescriptive Modeling	**2**	**T, U**
Advanced Artificial Intelligence	**2**	**T, U**

Examination forms	Writing questions
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/ Examination: Students must have more than 55/100 points overall to pass this course.
Reading list	Textbooks: None, but reference book(s) and/or articles/papers will be provided each lecture.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	x	X					
2			x	x			
3					x		
4						x	x

Intended Learning Outcomes (ILO)
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*

7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Advanced Big Data and AI applications	1, 2, 3, 4	Case/HW	Lecture Group forming. Class discussion Read book & lecture 1	
2	The importance and value of data	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 2.	
3	Models utilizing techniques of data mining and predictive analytics to produce desired outcomes	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 3.	
4	Design visualizations to explain key outcomes	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 4.	
5	Model outcomes for quality	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 5.	
6	Introduction to Python and Python Machine Learning	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 6	
7	Python for predictive analysis using classification	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 6	
8	Midterm review			Class discussion	
	Midterm		Written Exam		
9	Python and Decisions Trees	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 5	
10	Random Forests	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 5	
11	Linear Regression for continual data modeling Using Python	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 6	
12	Analysis by using Prescriptive Modeling	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 6	
13	Introduction to AI applications and AI regulations	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 7	
14	Advanced Artificial Intelligence	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 7	
15	K-Nearest Neighbor Predictive Models, Decision Tree Predictive Models; Random Forests using AI applications	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 8	
16	Linear Regression for continual data modeling Using AI applications	1, 2, 3, 4	Case/HW	Lecture Class discussion Read book & lecture 8	
17	Final review			Class discussion	
	Final exam		Written Exam		

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4

Cases and homework (30%)	Quiz, HW 60% Pass	Quiz, HW 60% Pass		Quiz, HW 60% Pass
Midterm Exam (30%)	Q1 50% Pass	Q2 50% Pass	Q3 50% Pass	Q4 50% Pass
Final Exam (40%)	Q1 50% Pass	Q2 50% Pass	Q3 50% Pass	Q4 50% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Semester Project Report			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Part 1. Problem (25%)			
Criterion 1: Problem Statement	**10**		
Criterion 2: Objectives of Study	**5**		
Criterion 3: Scope and Limitations	**5**		
Criterion 4: Literature Review	**5**		
Part 2. Proposed System Design and Solution (40%)			
Criterion 1: Proposed System	**10**		
Criterion 2: Proposed Solution	**15**		
Criterion 3: New Contribution	**15**		
Part 3. Results and Validation (35%)			
Criterion 1: Results	**15**		
Criterion 2: Validation	**20**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	**Demonstrates complete understanding of the problem. All requirements of task are included in response**
4	**Demonstrates considerable understanding of the problem. All requirements of task are included.**
3	**Demonstrates partial understanding of the problem. Most requirements of task are included.**
2	**Demonstrates little understanding of the problem. Many requirements of task are missing.**
1	**Demonstrates no understanding of the problem.**
0	**No response/task not attempted**

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

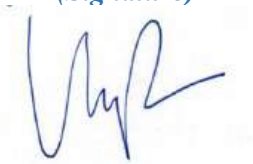
	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 08/08/2025

Ho Chi Minh City, 11/08/2025
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Industrial Engineering and Management

COURSE SYLLABUS
Course Name: Scientific Research Writing
Course Code: **IS114IU**

1. General information

Course designation	This course provides undergraduate students with a comprehensive introduction to the research process and scientific communication. It covers the key stages of conducting research—from identifying a topic and reviewing literature to designing methodology, collecting data, and presenting results. Alongside research skills, students will learn how to write technical reports, use proper citation practices, and communicate their findings effectively through written and oral presentations.
Semester(s) in which the course is taught	
Person responsible for the course	Dr. Pham Huynh Tram
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lectures, Exercises, Assignment.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 30 Private study including examination preparation, specified in hours1: 15
Credit points	3 (5 ECTS)

Required and recommended prerequisites for joining the course	Nil
Course objectives	This course introduces undergraduate students to the fundamental steps of the research process, including identifying research problems, conducting literature reviews, formulating research questions or hypotheses, designing methodology, collecting and analyzing data, and presenting findings. In parallel, students will develop essential skills in scientific writing and technical communication, learning how to structure reports, cite sources appropriately, and effectively present research outcomes in written and oral formats.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1 Explain the key steps in the research process. CLO2 Describe the structure and components of scientific and technical writing. CLO3 Identify appropriate sources and citation practices.
Skill	CLO4 Formulate clear problem statements and project objective CLO5 Conduct literature reviews using academic databases and summarize key findings. CLO6 Apply proper citation and referencing techniques CLO7 Present research findings clearly in written and oral forms.
Attitude	CLO8 Demonstrate academic integrity and ethical research behavior.

<table>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (3 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight (hour)</th><th>Level</th></tr>
<tr><td>Introduction</td><td>3</td><td>I</td></tr>
<tr><td>Problem statement and objective</td><td>3</td><td>T</td></tr>
<tr><td>Literature review</td><td>6</td><td>U</td></tr>
<tr><td>Describing methods, materials and processes</td><td>6</td><td>I</td></tr>
<tr><td>Presenting results and other visualization techniques</td><td>6</td><td>I</td></tr>
<tr><td>Writing abstract and conclusion</td><td>3</td><td>T</td></tr>
<tr><td>Poster and oral presentation</td><td>3</td><td>U</td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Practice, Writing questions</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
<tr><td>Reading list</td><td>Engineering your report – from start to finish, L.A. Krishnan, R. Jong, S. Kathpalia and T.M. Kim, Prentice Hall, 2003.</td></tr>
</table>

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-…) and Program/Student Learning Outcomes (SLO) (1 -…) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	x					
2	x					
3	x					
4			x			
5			x			
6			x			

7			x			
8				x		

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction	1,2		Slide + Lecture Note	
2	Problem statement & objective	4		Slide + Lecture Note	
3	Literature review – structure, link theory to research objective	3,5,6		Note + Practice	
4	Literature review – citing source and reference style	3,5,6		Note + Practice	
5	Describing methods, materials and processes	1,2		Note + Practice	
6	Describing methods, materials and processes	1,2		Note + Practice	
7	Research ethics & academic integrity	8		Note + Practice	
8	Review				
	Midterm				
9	Data collection techniques	1		Note + Practice	
10	Presenting results and other visualization techniques	7		Note + Practice	
11	Presenting results and other visualization techniques	7		Note + Practice	
12	Writing abstract and conclusion	7		Note + Practice	
13	Poster and oral presentation	7		Note + Practice	
14	Final presentation and course wrapup	7		Note + Practice	
15	Final presentation and course wrapup	7			
	Final exam	3			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	… 60%Pass	… 60%Pass	… …%Pass
Project (20%)	… 50%Pass	… 50%Pass	… 50%Pass
Midterm (30%)	… 50%Pass	… 50%Pass	
Final (40%)	… 50%Pass	… 50%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: ……. HW/Assignment: …….			
Date: …… Evaluator: ……			
	Max.	**Score**	**Comments**
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion …:			
Part 2….. (….%)			
Criterion 1 …:			
Criterion …:			
Part 3….. (….%)			
Criterion 1…:			
Criterion …:			
Part ….. (….%)			
TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response

4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

			mostly fact, with little questioning.	
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the	Language choices are thoughtful and generally support the effectiveness of the presentation.	Language choices are mundane and commonplace and partially support the effectiveness of the	Language choices are unclear and minimally support the effectiveness of the presentation. Language in

	effectiveness of the presentation. Language in presentation is appropriate to audience.	Language in presentation is appropriate to audience.	presentation. Language in presentation is appropriate to audience.	presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable , and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandabilit y of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.

Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 25/6/2025

Ho Chi Minh City, 25/06/2025

Dean of IEM School

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Probabilistic Models in Operation Research

Course Code: **IS024IU**

1. General information

Course designation	
Semester(s) in which the course is taught	**1**
Person responsible for the course	***Dr. Phan Nguyen Ky Phuc***
Language	**English**
Relation to curriculum	***Compulsory***
Teaching methods	***Lecture, lesson, project***
Workload (incl. contact hours, self-study hours)	***(Estimated) Total workload:*** ***Contact hours (please specify whether lecture, exercise, laboratory session, etc.):*** ***Private study including examination preparation, specified in hours[1]:***
Credit points	**3**
Required and recommended prerequisites for joining the course	

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	**This course is to introduce the fundamental probabilistic models in operation research field. The course shows how a probabilistic system can be analyzed and come up with formulas. Topics to be covered include: random variable, discrete distribution, continuous distribution, joint distribution, expectation, Markov Chain, Poisson Process, queueing model, and reliability.**
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1. Students are able to master the basic knowledge of modeling and calculating joint distributions of discrete and continuous system. CLO2. Students are able to master the basic knowledge of building the Markov Chain, find state space, and stability of the system CLO3. Students are able to master the basic knowledge of building the Markov Chain for the poison process, queuing models
Skill	CLO4. Students are able to apply their knowledge and develop practical skills for solving problems, conducting experiments and developing equipment and processes of engineering by using CPLEX software

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (4 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Introduction to discrete random variables	**2**	**I, T**
Most common discrete distribution and their applications	**2**	**I, T**
Joint distribution for discrete variable	**2**	**I, T**
Markov Chain	**2**	**I, T**
Exponential Distribution	**2**	**I, T**
Poisson Process	**2**	**I, T**
Queuing models: M/M/K, shoes side shop	**2**	**I, T**
Reliability	**2**	**I, T**
CPLEX	**1**	**U**

Examination forms	**Written Exam**
Study and examination requirements	**Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.** **Assignments/Examination: Students must have more than 50/100 points overall to pass this course.**
Reading list	**Textbooks:** **[1] Sheldon M. Ross, Introduction to Probability Models, 2014, 11th edition.** **References:** **1. A first course of Probability, 4th ed, Sheldon M. Ross, Prentice Hall**

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

	ILO						
CLO	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	**X**						
2	**X**						
3	**X**						
4						**X**	

Intended Learning Outcomes

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	**1.1**	**1.2**	**1.3**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**
1		**1.2a** **1.2b**	**1.3d**	**2.1a** **2.1b**	**2.2a**				
2		**1.2a** **1.2b**	**1.3d**	**2.1a** **2.1b**	**2.2a**				
3		**1.2a** **1.2b**	**1.3d**	**2.1a** **2.1b**	**2.2a**				
4		**1.2a**	**1.3d**		**2.2b**		**2.4b**	**2.5a**	

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1 &2	**Introduction to discrete random variables**	**1**		**Lecture**	
3 & 4	**Most common discrete distribution and their applications**	**1**	**HW1**	**Lecture** **Think pair-share** **HW**	
5&6	**Joint distribution for discrete variable**	**1**	**Quiz1**	**Lecture** **Quiz**	
7&8	**Markov Chain**	**2**	**HW2**	**Lecture** **HW**	
9	**Midterm**				
10 & 11	**Exponential Distribution**	**3**	**HW3**	**Lab**	
12	**Poisson Process**	**3**	**Quiz2**	**Lecture** **Quiz**	
13 & 14	**Queuing models: M/M/K, shoes side** **shop**	**3**	**HW4**	**Lecture** **HW**	
15	**Reliability**	**2**	**Quiz3**	**Lecture** **HW**	

				Group Project	
16	**CPLEX to solve the network problem**	**4**		**- Lecture** **Quiz**	
17	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
In-class exercises/quizzes (10%)	**Qz1 60%Pass**		**Qz3 60%Pass**	**... ...%Pass**
Howework exercises (20%)	**HW1 50%Pass**	**HW2 50%Pass**	**HW3 50%Pass**	**HW4 50%Pass**
Midterm (30%)		**60%Pass**		
Final (40%)			**60%Pass**	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: ……..** **Date: ……** **Evaluator: ……..**			
	Max.	**Score**	**Comments**
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion ...:			
Part 2….. (….%)			
Criterion 1 ...:			
Criterion ...:			

Part 3….. (….%)			
Criterion 1…:			
Criterion …:			
Part ….. (….%)			
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	**Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.**	**Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.**	**Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.**	**Issue/ problem to be considered critically is stated without clarification or description.**

Evidence ***Selecting and using information to investigate a point of view or conclusion***	**Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.**	**Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.**	**Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.**	**Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.**
Influence of context and assumptions	**Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.**	**Identifies own and others' assumptions and several relevant contexts when presenting a position.**	**Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).**	**Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.**
Student's position (perspective, thesis/hypothesis)	**Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.**	**Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.**
Conclusions and related outcomes (implications and consequences)	**Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.**	**Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.**	**Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.**	**Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.**

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.**
Language	**Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language**	**Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is**	**Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in**	**Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to**

	in presentation is appropriate to audience.	appropriate to audience.	presentation is appropriate to audience.	audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

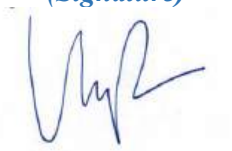
Source: Association of American Colleges and Universities

6. Date revised:

Ho Chi Minh City, dd/mm/yyyy

Dean of School of Industrial Engineering and Management

(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: MANUFACTURING PROCESSES

Course Code: **IS087IU**

1. General information

Course designation	*This subject will provide students with a basic background about the manufacturing processes of products by using machining technologies such as casting, forging, welding, turning, milling, grinding, . . . These are the basic machining processes and common use; students can apply and develop in manufacturing areas for produce new products with advanced technologies.*
Semester(s) in which the course is taught	7
Person responsible for the course	Nguyen Van Chung
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, Assignment
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	None

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	**Students will be provided with a fundamental and advanced concept of the manufacturing processes, understand the functions of machining technologies. Ability to use the technologies for manufacture new products with advanced machining processes.**
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Students will be able to Develop a fundamental and advanced concept of the manufacturing processes.**
Skill	**CLO2. Students will be able to understand the functions of machining technologies**
Attitude	**CLO3. Ability to use the technologies for manufacturing new products with advanced machining processes.**

Content	***The description of the contents should clearly indicate the weighting of the content and the level.*** **Weight: lecture and practice session** **Teaching levels: I (Introduce); T (Teach); U (Utilize)**

Topic	**Content**	**Weight (hour)**	**Level**
Introduction to Manufacturing	Manufacturing; Materials in manufacturing; Manufacturing Processes Chapter 1 (Rajender Singh) Chapter 1 (H.N. Gupta, et al)	1	I, T
Properties of Materials	Properties of Materials, Classification of Engineering materials; Ferrous metals; Non-Ferrous metal. Chapter 7 (Rajender Singh) Chapter 2 (H.N. Gupta, et al) Chapter 4 (Mikell P. Groover)	1	I, T
Mold and Casting	Introduction; Casting Technology; Metal casting Process. Chapter 12, 13 (Rajender Singh) Chapter 3, 4 (H.N. Gupta, et al)	2	T, U
Forging	Classification of forging, Die forging, Machine forging. Chapter 14 (Rajender Singh) Chapter 2 unit2 (H.N. Gupta, et al)	1	T, U
Wedding	Wedding Process; Wedding Technology; Wedding Joints; Gas wedding processes; Arc wedding processes Chapter 17 (Rajender Singh) Chapter 9 (H.N. Gupta, et al) Chapter 29, 30 (Mikell P. Groover)	**1**	**T, U**
Sheet metal working	Cutting Operation; Bending operations; Drawing Chapter 18 (Rajender Singh) Chapter 20 (Mikell P. Groover)		**T, U**
Lathe Operations	Center Lathe, Cutting tools, chuck, lathe operation. Chapter 1 unit 3 (H.N. Gupta, et al) Chapter 20, 21 (Rajender Singh)		**T, U**

	Chapter 21, 22 (Mikell P. Groover)		
Midterm Exam			
Milling Operations	**Basic milling process, Types of milling process, milling machines.** Chapter 4 unit 3 (H.N. Gupta, et al) Chapter 24 (Rajender Singh)	**3**	**T, U**
Shaping Operations	Principle of working, cutting tools, shaping machine Chapter 2 unit 3 (H.N. Gupta, et al) Chapter 23 (Rajender Singh)	1	T, U
Grinding Operations	Analysis of the Grinding Process; Application consideration in Grinding; Grinding operations and grinding machines Chapter 25 (Mikell P. Groover)	1	T, U
Mechanical Advanced Machining Processes	Ultrasonic Machining; Water jet machining; Photochemical Milling; Electro discharge machining; Laser beam machining Chapter 2, 3, 4, 5 (Hassan El-Hofy)	1	T, U
Lab: Machining Operations: Turning, Drilling, Milling	Handout	2	U
Final Exam			

Examination forms	Answer questions
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed based on their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.

Reading list	[1] Rajender Singh, *Introduction to basic Manufacturing Processes and Workshop Technology*, New Age International (P) Limited, 2006. [2] H.N. Gupta, R.C. Gupta, Arun Mittal, *Manufacturing Processes*, New Age International (P) Limited, Publishers 2009. [3] Mikell P. Groover *Fundamentals of Modern Manufacturing*, John Wiley & Son, 2010. [4] Hassan El-Hofy, Advanced Machining Process, Mc Graw – Hill, 2005 [5] Kalpakjian and Schmid, *Manufacturing Engineering and Technology*, Prentice Hall, New Jersey, 2013. [6] DeGarmo, Black, and Kohser, *Materials and Processes in Manufacturing*, John Wiley & Sons, Inc, New York, 2011

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	**7**
1	x						
2				x			
3						x	

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2	1.1b		1.3c					2.5b	2.6b
3		1.2a	1.3d		2.2b		2.4b	2.5 a	

3. Planned learning activities and teaching methods.

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Manufacturing	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [2]
2	Properties of Materials	CLO 2	Quiz	Lecture presentation, in-class discussion	Reading [1] , [2], [3]
3	Mold and Casting	CLO 3	Exercises, HW, Quiz	Lecture presentation, in-class discussion	Reading [1] , [2]
4	Forging	CLO 3	Exercises, HW,	Lecture presentation, in-class discussion	Reading [1] , [2]
5	Welding	CLO 3	Exercises, HW,	Lecture presentation, in-class discussion	Reading [1] , [2], [3]
6	Sheet metal work	CLO 3	Exercises, HW,	Lecture presentation, in-class discussion	Reading [1] , [3]
7	Lathe Operations	CLO 3	Exercises, HW, Quiz	Lecture presentation, in-class discussion	Reading [1] , [3]
8-9	Midterm				
10-11	Milling Operations	CLO 3	Exercises, HW, Quiz	Lecture presentation, in-class discussion	Reading [1]
12	Shaping Operations	CLO 3	Exercises, HW	Lecture presentation, in-class discussion	Reading [1]
13	Grinding Operations	**3**	Exercises, HW	Lecture presentation, in-class discussion	Reading [3]
14-15	Mechanical Advanced Machining Processes	**CLO 3**	Exercises	Lecture presentation, in-class discussion	Reading [4]
16-17	Lab: Machining Operations: Turning, Drilling, Milling	**CLO 3**	Practice	Practice	Handout
18	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class Exercises, quizzes, homework (15%)	Quiz, HW 60% Pass	Quiz, HW 60% Pass	
Assignment,lab (15%)		80% Pass	
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)		60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2.Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence ***Selecting and using information to investigate a point of view or conclusion***	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

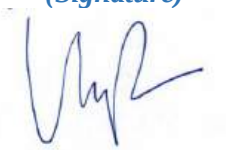
Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.**
Language	**Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.**
Delivery	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.**
Supporting Material	**A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.**
Central Message	**Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)**	**Central message is clear and consistent with the supporting material.**	**Central message is basically understandable but is not often repeated and is not memorable.**	**Central message can be deduced but is not explicitly stated in the presentation.**

Source: Association of American Colleges and Universities

6. Date revised: March 30th, 2024.

Ho Chi Minh City, 26/04/2024.
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Data Collection, Analysis and Applications

Course Code: **IS092IU**

1. General information

Course designation	This class is about data collection, organization, analysing, and visualizing data in an accurate and compelling manner for your audience. Data collection, data analysis, and data visualization are all a) interconnected and thus b) equally important. In other words: you will learn and practice how to handle data professionally and responsibly. These are the skills, tools, and concepts that you need to be successful in your future regardless of your major today.
Semester(s) in which the course is taught	
Person responsible for the course	
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (please specify whether lecture and assignments): 60 Private study including examination preparation, specified in hours[1]: 30
Credit points	3

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td></td></tr>
<tr><td>Course objectives</td><td>Students will be provided with knowledge and skills from understanding data, data collection methods, analysis using different tool for decision making through research design methodologies.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><td>Competency level</td><td>Course learning outcome (CLO)</td></tr>
<tr><td>Knowledge</td><td>CLO1: Identify, explain, and demonstrate the steps, tools, and skills involved in real-world data collection, data analysis, and data visualization efforts.</td></tr>
<tr><td>Skill</td><td>CLO2: Effectively select appropriate modes and tools of inquiry, analysis, interpretation, evaluation, and communication in the context of data collection, data analysis, and data visualization.</td></tr>
<tr><td>Attitude</td><td>CLO3: Evaluate the ethical issues and biases surrounding data collection, data analysis, and data visualization. Understand the role of data (and its appropriate use) to answer relevant societal questions at a variety of scales across space and time.</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Content</td><td>

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

<table>
<tr><th>Topic</th><th>Weight (hour)</th><th>Level</th></tr>
<tr><td>Introduction and course overview</td><td>3</td><td>I, T</td></tr>
<tr><td>Research design and planning</td><td>3</td><td>I, T</td></tr>
<tr><td>Statistics review: Confidence interval; rational sampling;</td><td>3</td><td>I, T</td></tr>
<tr><td>Data Collection Methods - Surveys and questionnaires</td><td>3</td><td>I, T</td></tr>
<tr><td>Data Collection Methods - Interviews and focus groups</td><td>3</td><td>I, T</td></tr>
<tr><td>Ethics and Data Collection</td><td>3</td><td>T, U</td></tr>
<tr><td>Qualitative research designs</td><td>3</td><td>T, U</td></tr>
<tr><td>Big Data: Types and Collection methods</td><td>3</td><td>T, U</td></tr>
<tr><td>Data cleaning and preparation</td><td>3</td><td>T, U</td></tr>
<tr><td>Data Analysis</td><td>6</td><td>T, U</td></tr>
<tr><td>Programming Tools for data analysis</td><td>6</td><td>T, U</td></tr>
</table>

</td></tr>
<tr><td>Examination forms</td><td>Writing examination</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
<tr><td>Reading list</td><td>

[1] Creswell, J. W. (2018). Research design: Qualitative, quantitative, and mixed methods approaches. 5th edition, Thousand Oaks, California: Sage.

[2] Maxwell, J. A. (2012). Qualitative research design: An interactive approach. Thousand Oaks, California: Sage.

[3] *R. Kumar (2015). Research Methodology: A Step-by-Step Guide for Beginners. Sage Publishing*.

[4] *Galit S. et al (2019), Data Mining for Business Analytics, Wiley.*

</td></tr>
</table>

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

Intended Learning Outcomes (*ABET Student Outcomes*)
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction and course overview	1		Lecture presentation, in-class discussion, group forming	Reading [1]
2	Research design and planning	1	Quiz	Lecture presentation, in-class discussion	Reading [1], [4]
3	Statistics review: Confidence interval; rational sampling;	1	Quiz	Lecture presentation, in-class discussion	Reading [1] , [4]
4	Data Collection Methods - Surveys and questionnaires	1	Group assignment	Lecture presentation, in-class discussion	Reading [2] , [3], [4]
5	Data Collection Methods - Interviews and focus groups	2	Group assignment	Lecture presentation, in-class discussion	Reading [2] , [3], [4]
6	Ethics and Data Collection	2	Group assignment	In-class discussion, wrap-up	
7	Qualitative research designs	2	Project presentation		
8	**Midterm exam**				
9	Big Data: Types and Collection methods	2	Group assignment	Lecture presentation, in-class discussion	Reading [2] , [3], [4]
10	Data cleaning and preparation	2	Individual & Group assignment	Lecture/Practice	Reading [2], [3], [4]
11	Data Analysis: Descriptive statistics; Correlation and Regression analysis	2	Individual & Group assignment	Lecture/Practice	Reading [2] , [3], [4]
12	Data Analysis: Time Series Analysis; Data Visualization	3	Indiviudal & group assignemtn	Lecture/Practice	Reading [4] and Articles
13	Programming Tools for data analysis: SPSS/NVivo/python/R/Matlab/Excel	3	Project presentation	Lecture/Practice	
14	Programming Tools for data analysis (Continue)	3	**Project presentation**		
15	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Process assessment (10%)	Group assignment/Quiz 60% Pass	Group assignment/Quiz 60% Pass	Homework 60% Pass	
Group projects (20%)		Group project 80% Pass	Group project 80% Pass	Group project 80% Pass
Midterm assessment (30%)	Theory/Laboratory midterm exam 60% Pass		Laboratory midterm exam 60% Pass	
Final assessment (40%)	Theory/Laboratory final exam 60% Pass		Laboratory final exam 60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: ……..** **Date: ……** **Evaluator: ……..**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			

Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	**Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.**	**Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.**	**Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.**	**Issue/ problem to be considered critically is stated without clarification or description.**
Evidence ***Selecting and using information to investigate a point of view or conclusion***	**Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.**	**Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.**	**Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.**	**Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.**

Influence of context and assumptions	**Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.**	**Identifies own and others' assumptions and several relevant contexts when presenting a position.**	**Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).**	**Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.**
Student's position (perspective, thesis/hypothesis)	**Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.**	**Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.**
Conclusions and related outcomes (implications and consequences)	**Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.**	**Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.**	**Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.**	**Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.**

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.**
Language	**Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.**	**Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.**

Delivery	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.**
Supporting Material	**A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.**
Central Message	**Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)**	**Central message is clear and consistent with the supporting material.**	**Central message is basically understandable but is not often repeated and is not memorable.**	**Central message can be deduced but is not explicitly stated in the presentation.**

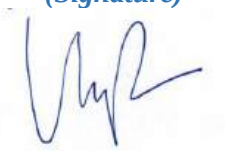
Source: Association of American Colleges and Universities

6. Date revised: 16/12/2023

Ho Chi Minh City, 26/04/2024

Head of School of Industrial Engineering and Management

(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: COLD CHAIN SYSTEMS

Course Code: **IS105IU**

1. General information

Course designation	This is a course about the cold chain system, which is the technology and process that allows for the safe transport of temperature-sensitive goods and products along the supply chain. It relies heavily on science to evaluate and accommodate for the link between temperature and perishability such as: meat and seafood, produce, medical supplies, pharmaceuticals, etc.. Besisdes that, the course will introduce technologies that rely on physical means to ensure appropriate temperature conditions along the supply chain, and processes that consist of a series of tasks to prepare, store, transport, and monitor temperature-sensitive products.
Semester(s) in which the course is taught	6 and 8 (Semester 2/academic year)
Person responsible for the course	*Logistics and Supply Chain Management Lecturers*
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project.

Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture and assignments): 45 (42 - lecture hours, 3 - group presentation hours) Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	*Student have to complete the course of Principles of Logistic and Supply Chain Management and Warehouse Engineering Management*
Course objectives	Students will be provided with knowledge and skills of fundamental concepts, business processes and basic models/tools to solve problems in different stages of cold chain systems. Students will be able to apply the real-world concepts discussed upon entering the workforce and will be better prepared to succeed in their careers.
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Students will be able to understand the key concepts of cold chain (CC) and cold chain systems (CCS), recognize and solve complex tasks and problems across several disciplines from global, economic, environmental and societal aspects.**
Skill	**CLO2. Students will be able to identify, abstract, structure, formulate, and solve CC problems by applying principles of LSCM to evaluate, plan, choose and apply adequate methods.**
Attitude	**CLO3. Students will have integrative knowledge of soft skills and foreign language, have positive leadership attitude in both self-learning and group work, especially working in groups solving CC problems.**

[1] When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Content	***The description of the contents should clearly indicate the weighting of the content and the level.*** **Weight: lecture session (3 hours/session)** **Teaching levels: I (Introduce); T (Teach); U (Utilize)**			
	Topic	**Content**	**Weight (hour)**	**Level**
	Introduction to Cold Chain Systems	Cold Chain Management Historical and Modern Development Basic components for Cold Chain Global Cold Chain Management Cold Chain Regulations and Standards	3	I
	Cold chain logistics	Principles of Cold Chain Logistics Features of Cold Chain Logistics Structure of Cold Chain Logistics Product Characteristics Traditional Supply Chain Versus Cold Chain Management	6	I
	Cold Chain Warehouse and Transport	Introduction to Cold Chain Warehouse and Transport Facilities and Equipment in Cold Chain Cold Chain Warehouse Operations Cold Chain Transport Operations	6	I, T, U
	Cold chain last mile delivery	Introduction to cold chain last mile delivery Practices of cold chain last mile delivery Technologies and methods to improve efficiency of cold chain last mile delivery	3	I, T, U
	Cold chain technologies and monitoring tools	Cold chain technologies Cold chain monitoring tools	3	I, T, U
	Temperature Management in Cold Chain	Analysis on Product Characteristics of the Commodities Multi-commodity Cold Storage Management Optimal Target Temperature Methods to Define Optimal Target Temperature	3	I, T, U
	Midterm Exam			
	Quality Assessment in Cold Chain	Quality Assessment Using Wireless Sensors Respiratory Metabolism Quality Assessment Methodologies	6	I, T, U
	Design and Implementation of a Smart Cold Chain	Smart Refrigerator: A Smart Appliance for Smart Home Common Issues and Challenges with Typical Refrigerator	6	I, T, U

		The essentials of a Smart Refrigerator Development of Smart Refrigerators Common Concerns About Smart Refrigerators Design and Development Trends in Cold Chain		
	Cold Chain Practices	Food Cold Chain Medicinal Cold Chain Vaccine Cold Chain Socio-economic and Environmental Impacts of Cold Chain	6	I, T, U
	Group project presentation		3	U
	Final Exam			
Examination forms	Writing examination			
Study and examination requirements	Attendance: A minimum attendance of 70 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.			
Reading list	1. Lecture Notes + selected journal articles. 2. Aung, M. M., & Chang, Y. S. (2022). Cold Chain Management. Springer International Publishing AG. 3. Majeed Mohammed, Vijay Yadav Tokala Cold Chain Management for the Fresh Produce Industry in the Developing World. United States: CRC Press, 2021. 4. Pawar, K. S. (2018). Cold Chain Supply Chain Management. United Kingdom: Emerald Publishing Limited. 5. A. Langevin, D. Riopel (2005). Logistics Systems - Design & Optimization. Springer			

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Program/Student Learning Outcomes (SLO) (1-7) is shown in the following table:

	PLO/SLO						
CLO	1	2	3	4	5	6	**7**
1		x					
2	x						
3			x		x		

Student Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a							
2		1.2b		2.1 a 2.1 b					
3		1.2 a	1.3 d					2.5 a	
4	1.1 c		1.3 b						2.6 a

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Cold Chain Systems	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [2]
2-3	Cold chain logistics	CLO 1,2	Group assignment – task 1	Lecture presentation, in-class discussion	Reading [1] , [2]

4-5	Cold Chain Warehouse and transportation	CLO 1,2	Group assignment – task 2	Lecture presentation, in-class discussion	Reading [1] , [2]
6	Cold chain last mile delivery	CLO 1,2	Group assignment – task 4	Lecture presentation, in-class discussion	Reading [1] , [2]
7	Cold chain technologies and equipment	CLO 1, 2	Group assignment – task 5	Lecture presentation, in-class discussion	Reading [1] , [2]
8	Temperature Management in Cold Chain	CLO 1	Group assignment – task 4	Lecture presentation, in-class discussion	Reading [1] , [2]
	Midterm				
9-10	Quality Assessment in Cold Chain	CLO 1,2	Group assignment – task 5	Lecture presentation, in-class discussion	Reading [1] , [2]
11-12	Design and Implementation of a Smart Cold Chain and Case Study	CLO 1,2	Group assignment – task 6	Lecture presentation, in-class discussion	Reading [1] , [2]
13-14	Cold Chain Practices	CLO 1,2	Group assignment – task7	Lecture presentation, in-class discussion	Reading [1] , [2]
15	Group project presentation	CLO 3	Report and oral presentation		
	Final exam				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Group assignment - tasks (10%)	Group assignment - tasks 60% Pass	Group assignment - tasks 60% Pass	
Group projects (20%)			Group project 80% Pass
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)	60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: ……..	**HW/Assignment: ……..**		
Date: ……	**Evaluator: ……..**		
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

			identified clearly.	

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 16/12/2023

	Ho Chi Minh City, 26/04/2024 ***Dean of School of Industrial Engineering and Management*** ***(Signature)*** ***Assoc. Prof. Dr. Nguyen Van Hop***

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Industrial Engineering and Management

COURSE SYLLABUS

Course Name: Engineering Computing Skills

Course Code: IS113IU

1. General information

Course designation	*This course is designed to combine knowledge of business information technologies. It explores the engineering hardware and software as well as information system. This study includes fundamentals of database management, Power BI, and DAX. The course will prepare students to work in a variety of industries.*
Semester(s) in which the course is taught	
Person responsible for the course	*Please indicate a specific person.*
Language	English
Relation to curriculum	*Compulsory / elective / specialisation* *Names of other study programmes with which the module is shared*
Teaching methods	*lecture, lesson, practical problem*
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 135 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 (45 lecture + 15 Lab) Private study including examination preparation, specified in hours: 30
Credit points	3
Required and recommended prerequisites for joining the course	Recommended:

<table>
<tr><td>Course objectives</td><td>This course emphasizes the abilities of computer system and their application in engineering field. The course will equip students with effective computer tools for industry problems</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1 Students will gain deep understanding of Entity relationship diagrams (ERD), or ER models, show the logical structure of databases and highlight the interrelations between specific concepts, or entities, in a given topic area</td></tr>
<tr><td>Skill</td><td>CLO2 Students will apply their knowledge to design database solutions to different problem which relies on SQL.</td></tr>
<tr><td>Attitude</td><td>CLO3 Students will have the ability to analyze data of system and use supporting tools such as DAX and Power BI</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Content</td><td>

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

<table>
<tr><th>Topic</th><th>Weight (hour)</th><th>Level</th></tr>
<tr><td>Introduction to Computer and Information System</td><td>3</td><td>I, T</td></tr>
<tr><td>Introduction to ERD- and main concepts of ERD</td><td>3</td><td>I, T</td></tr>
<tr><td>Introductions to Python and SQLite</td><td>3</td><td>I, T</td></tr>
<tr><td>SQL command sets</td><td>3</td><td>I, T</td></tr>
<tr><td>Practice SQLite and Python</td><td>3</td><td>I, T</td></tr>
<tr><td>Introduction to Power Appsheet</td><td>3</td><td>T, U</td></tr>
<tr><td>Power Appsheet Practice</td><td></td><td></td></tr>
<tr><td>Introduction to Power BI- Data Acquisition and Preparation</td><td>3</td><td>T, U</td></tr>
<tr><td>Introduction to Power BI- Data Modelling</td><td>3</td><td>T, U</td></tr>
<tr><td>Introduction to Power BI- Report Building</td><td>3</td><td>T, U</td></tr>
<tr><td>Introduction to Power BI- Publishing and Sharing</td><td>3</td><td>T, U</td></tr>
<tr><td>Introduction to DAX- DAX Syntax and Structure</td><td>3</td><td>T, U</td></tr>
<tr><td>Introduction to DAX- DAX Function</td><td>3</td><td>T,U</td></tr>
</table>

</td></tr>
<tr><td>Examination forms</td><td>Project and Writing examination</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
</table>

Reading list	*SQLite Database System Design and Implementation* *Power BI for the Excel Analysis* *Collect transform and combine data using Power BI and Power Query in excel* *The definitive guide to DAX*

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-…) and Program/Student Learning Outcomes (SLO) (1 -…) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Computer and Information System	1		Slide + Lecture Note	
2	Introduction to ERD- and main concepts of ERD	1		Slide + Lecture Note	
3	Introductions to Python and SQLite	1		Note + Practice	
4	SQL command sets	2		Note + Practice	
5	Practice SQLite and Python	2		Note + Practice	
6	Introduction to Power Appsheet	2		Note + Practice	
7	Power Appsheet Practice	2		Note + Practice	
8	Midterm	2			
9	Introduction to Power BI- Data Acquisition and Preparation	3		Note + Practice	
10	Introduction to Power BI- Data Modelling	3		Note + Practice	
11	Introduction to Power BI- Report Building	3		Note + Practice	

12	Introduction to Power BI- Publishing and Sharing	3		Note + Practice	
13	Introduction to DAX- DAX Syntax and Structure	3		Note + Practice	
14	Introduction to DAX- DAX Function	3		Note + Practice	
15	Final exam	3			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	… 60%Pass	… 60%Pass	… …%Pass
Project (20%)	… 50%Pass	… 50%Pass	… 50%Pass
Midterm (30%)	… 50%Pass	… 50%Pass	
Final (40%)	… 50%Pass	… 50%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: ……. HW/Assignment: ……. Date: …… Evaluator: ……			
	Max.	**Score**	**Comments**
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion …:			
Part 2….. (….%)			
Criterion 1 …:			
Criterion …:			
Part 3….. (….%)			
Criterion 1…:			
Criterion …:			

Part ….. (….%)			
TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged.	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

	Others' points of view are synthesized within position (perspective, thesis/ hypothesis).			
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable , and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandabilit y of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or

	significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	presentation or establishes the presenter's credibility/ authority on the topic.	presentation or establishes the presenter's credibility/ authority on the topic.	establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised:

Ho Chi Minh City, 25/06/2025

Dean of IEM School

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **Department/School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Industrial Intelligent System

Course Code: IS095IU

1. General information

Course designation	
Semester(s) in which the course is taught	
Person responsible for the course	*Please indicate a specific person.*
Language	English
Relation to curriculum	*Compulsory / elective / specialisation* *Names of other study programmes with which the module is shared*
Teaching methods	*lecture, lesson, project*
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 75 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): (45 lecture) Private study including examination preparation, specified in hours: 30
Credit points	3
Required and recommended prerequisites for joining the course	Recommended:

<table>
<tr><td>Course objectives</td><td>This course introduces students to the field of Artificial Intelligence (AI) with emphasis on its use to solve real world problems for which solutions are difficult to express using the traditional algorithmic approach. It explores the essential theory behind methodologies for developing systems that demonstrate intelligent behaviour including dealing with uncertainty, learning from experience and following problem solving strategies found in nature.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1 Students will gain deep understanding of the basic artificial intelligence techniques.</td></tr>
<tr><td>Skill</td><td>CLO2 Students will apply their knowledge to design solutions to different problems.</td></tr>
<tr><td>Attitude</td><td>CLO3 Students will have the ability to design and develop an intelligent system for a selected application.</td></tr>
</table></td></tr>
</table>

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight (hour)**	**Level**
Informed (Heuristic) Search	**3**	**I, T**
Iterative Search	**3**	**I, T**
Adversarial Search	**3**	**I, T**
Knowledge Representation and Reasoning	**3**	**I, T**
Rule-Based Expert Systems	**3**	**T, U**
Managing Uncertainty in Rule Based Expert Systems	**3**	**T, U**
Fuzzy Expert Systems	**3**	**T, U**
Machine Learning	**3**	**T, U**
Decision Trees	**3**	**T, U**
Artificial Neural Networks	**3**	**T, U**
Advanced Artificial Neural Networks	**3**	**T,U**
Evolutionary Algorithms	**3**	**T,U**
Evolutionary Metaheuristics	**3**	**T,U**
Swarm Intelligence	**3**	**T,U**

Examination forms	Project and Writing examination
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	*Intelligent system a modern approach, 1st Ed. , Springer-Verlag Berlin Heidelberg, Year: 2011* *Intelligent systems for Engineers and Scientistis: A Practical Guide to Artificial Intelligence 4th Ed. CRC Press* *Artificial Intelligence- A Guide to Intelligent systems 3rd Ed. Addison Wesley*

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-…) and Program/Student Learning Outcomes (SLO) (1 -…) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Informed (Heuristic) Search	1		T,U	Graph tool
2	Iterative Search	1		T,U	Graph tool
3	Adversarial Search	1	HW1	T,U	Graph tool
4	Knowledge Representation and Reasoning	2		I,U	GeNIe Modeler
5	Rule-Based Expert Systems	2		I,U	Numpy
6	Managing Uncertainty in Rule Based Expert Systems	2		T	Numpy
7	Fuzzy Expert Systems	2	HW2	T	Numpy
8	Midterm				
9	Machine Learning	1		T	Scikit-learn
10	Decision Trees	1	HW3	T	Scikit-learn
11	Artificial Neural Networks	1		T	Scikit-learn
12	Advanced Artificial Neural Networks	1	HW4		Scikit-learn
13	Evolutionary Algorithms	1		T	Numpy
14	Evolutionary Metaheuristics	1		T	Numpy
15	Swarm Intelligence	1		T	Numpy
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	… 60%Pass	… 60%Pass	… …%Pass

Project (20%)	… 50%Pass	… 50%Pass	… 50%Pass
Midterm (30%)	… 50%Pass	… 50%Pass	
Final (40%)	… 50%Pass	… 50%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion …:			
Part 2….. (….%)			
Criterion 1 …:			
Criterion …:			
Part 3….. (….%)			
Criterion 1…:			
Criterion …:			
Part ….. (….%)			
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response

4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 17/12/2023

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **Department/School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Industrial & Commercial Data Systems

Course Code: IS099IU

1. General information

Course designation	The course focuses on acquiring hands-on experience in the organization, modeling, and analyzing raw data to extract pertinent information and actionable insights for industrial and engineering systems. Covered topics include data processing, visualization, analysis using statistical programming software (in particular, R), database management using structured query language programming, the design and implementation of data science solutions (e.g., regression, classification, and time series analysis), as well as some important considerations in data science modeling (e.g., cross-validation, bias-variance trade-off, model evaluation, etc.). The course is project-based and involves a number of engineering case studies from manufacturing, materials engineering, and renewable energy systems
Semester(s) in which the course is taught	6
Person responsible for the course	*Please indicate a specific person.*
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, homework, project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 75 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): (45 lecture) Private study including examination preparation, specified in hours: 30

<table>
<tr><td>Credit points</td><td>3</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Recommended: Engineering Probability & Statistics, Introduction to Computing</td></tr>
<tr><td>Course objectives</td><td>By the end of this course, students should successfully be able to:
- Understand the differences and connections between emerging terms, concepts, and topics in machine learning and information systems, as well as their relevance to today’s information era, industry 4.0, design and operation of cyber-physical systems.
- Gain advanced-level experience in engineering-driven data science modeling, programming, and forecasting using the statistical programming software R.
- Gain intro-level experience in creating, managing, labeling, and querying databases using MySQL's database management software.
- Design and implement data science models and solutions using real-world datasets to solve important engineering problems in manufacturing, materials, and energy.
- Learn how to test and evaluate a data science model or solution in the context of a real-world problem.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course, students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1 Students will gain deep understanding of the basic artificial intelligence techniques.</td></tr>
<tr><td>Skill</td><td>CLO2 Students will apply their knowledge to design solutions to different problems.</td></tr>
<tr><td>Attitude</td><td>CLO3 Students will have the ability to design and develop an intelligent system for a selected application.</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Content</td><td>

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

<table>
<tr><th>Topic</th><th>Weight (hour)</th><th>Level</th></tr>
<tr><td>Informed (Heuristic) Search</td><td>3</td><td>I, T</td></tr>
<tr><td>Iterative Search</td><td>3</td><td>I, T</td></tr>
<tr><td>Adversarial Search</td><td>3</td><td>I, T</td></tr>
<tr><td>Knowledge Representation and Reasoning</td><td>3</td><td>I, T</td></tr>
<tr><td>Rule-Based Expert Systems</td><td>3</td><td>T, U</td></tr>
<tr><td>Managing Uncertainty in Rule Based Expert Systems</td><td>3</td><td>T, U</td></tr>
<tr><td>Fuzzy Expert Systems</td><td>3</td><td>T, U</td></tr>
<tr><td>Machine Learning</td><td>3</td><td>T, U</td></tr>
<tr><td>Decision Trees</td><td>3</td><td>T, U</td></tr>
<tr><td>Artificial Neural Networks</td><td>3</td><td>T, U</td></tr>
<tr><td>Advanced Artificial Neural Networks</td><td>3</td><td>T,U</td></tr>
<tr><td>Evolutionary Algorithms</td><td>3</td><td>T,U</td></tr>
<tr><td>Evolutionary Metaheuristics</td><td>3</td><td>T,U</td></tr>
<tr><td>Swarm Intelligence</td><td>3</td><td>T,U</td></tr>
</table>

</td></tr>
<tr><td>Examination forms</td><td>Project and Writing examination</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
<tr><td>Reading list</td><td>[1] An Introduction to Statistical Learning with Applications in R, by Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani, Springer
[2] Forecasting: Principles and Practice, by Rob J Hyndman and George Athanasopoulos, John Wiley and Sons</td></tr>
</table>

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-…) and Program/Student Learning Outcomes (SLO) (1 -…) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Informed (Heuristic) Search	1		T,U	Graph tool
2	Iterative Search	1		T,U	Graph tool
3	Adversarial Search	1	HW1	T,U	Graph tool
4	Knowledge Representation and Reasoning	2		I,U	GeNIe Modeler
5	Rule-Based Expert Systems	2		I,U	Numpy
6	Managing Uncertainty in Rule Based Expert Systems	2		T	Numpy
7	Fuzzy Expert Systems	2	HW2	T	Numpy
8	Midterm				
9	Machine Learning	1		T	Scikit-learn
10	Decision Trees	1	HW3	T	Scikit-learn
11	Artificial Neural Networks	1		T	Scikit-learn
12	Advanced Artificial Neural Networks	1	HW4		Scikit-learn
13	Evolutionary Algorithms	1		T	Numpy
14	Evolutionary Metaheuristics	1		T	Numpy
15	Swarm Intelligence	1		T	Numpy
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	… 60%Pass	… 60%Pass	… …%Pass
Project (20%)	… 50%Pass	… 50%Pass	… 50%Pass

Midterm (30%)	… 50%Pass	… 50%Pass	
Final (40%)	… 50%Pass	… 50%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion …:			
Part 2….. (….%)			
Criterion 1 …:			
Criterion …:			
Part 3….. (….%)			
Criterion 1…:			
Criterion …:			
Part ….. (….%)			
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1

Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 15/12/2023

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: E-COMMERCE SYSTEMS

Course Code: **IS106IU**

1. General information

Course designation	*This course introduce students both theory and practice of conducting business over the Internet and World Wide Web, i.e., E-Commerce business. The content includes four sections introduction, business strategies, technologies and integration.*
Semester(s) in which the course is taught	5
Person responsible for the course	
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture and assignments): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	
Course objectives	*Students will be provided with complete coverage of the key business and technology elements of electronic commerce (E-commerce). Students will be able to apply the real-world cases discussed upon entering the workforce and will be better prepared to succeed in their careers.*
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	Course learning outcome (CLO)
Knowledge	CLO1. Students will be able to understand the key concepts of e-commerce systems recognize and solve complex tasks and problems across several disciplines from global, economic, environmental and societal aspects.
Skill	CLO2. Students will be able to identify, abstract, structure, formulate, practice, and solve e-commerce problems by applying business analytics techniques.
Attitude	CLO3. Students will have positive attitude in both self-learning and group work, especially working in groups solving and managing e-commerce system problems.

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture and practice session Teaching levels: I (Introduce); T (Teach); U (Utilize) ***Theory***

Topic	**Content**	**Weight (hour)**	**Level**
Introduction to E-commerce		3	I, T
Marketplace analysis for E-commerce and E-Commerce Business Strategies		3	I, T, U
E-commerce Marketing and Advertising		3	I, T, U
E-procurement and Business-to-Business Activities		3	I, T, U
Social Networking, Mobile Commerce and Online Auctions		3	
Customer Relationship Management		3	I, T, U
Environment of E-commerce: Legal, Ethical, Tax Issues		3	I, T, U
Midterm Exam			
E-commerce Infrastructure - Web Server Hardware & Software		6	I, T, U
Building an E-commerce Presence		6	I, T, U
E-Commerce Security and Payment Systems		6	I, T, U
Group project presentation and Final Exam Review		6	I, T, U
Final Exam			

Examination forms	Writing examination
Study and examination requirements	**Attendance**: A minimum attendance of 70 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. **Assignments/Examination**: Students must have more than 50/100 points overall to pass this course.

Reading list	[1] Gary P. Schneider. (2017). *Electronic Commerce*. 12th Edition. Cengage Learning. [2] Kenneth, C. L., & Carol, G. T. (2022). *E-commerce: Business, Technology, Society*. 17th Edition. Pearson Education. [3] Chaffey, D. (2015). Digital business and E-commerce Management: Strategy, Implementation and Practice. 6th Edition. Pearson Education.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	**7**
1	x	x					
2						x	x
3			x		x		

Intended Learning Outcomes (*ABET Student Outcomes*)

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1									
2									
3									

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to E-commerce	CLO 1		Lecture presentation, in-class discussion, group forming	Reading [1], [2] , [3]
2	Marketplace analysis for E-commerce and E-Commerce Business Strategies	CLO 1,2	Quiz	Lecture presentation, in-class discussion	Reading [1], [2] , [3]
3	E-commerce Marketing and Advertising	CLO 1,2	Quiz	Lecture presentation, in-class discussion	Reading [1], [2] , [3]
4	E-procurement and Business-to-Business Activities	CLO 1,2	Group assignment	Lecture presentation, in-class discussion	Reading [1], [3]
5	Social Networking, Mobile Commerce and Online Auctions	CLO 1, 2	Group assignment	Lecture presentation, in-class discussion	Reading [1], [2]
6	Customer Relationship Management	CLO 1, 2	Group assignment	Lecture presentation, in-class discussion	Reading [3]
7	Environment of E-commerce: Legal, Ethical, Tax Issues	CLO 1, 2	Group assignment	Lecture presentation, in-class discussion	Reading [1], [2]
	Midterm exam				
8-9	E-commerce Infrastructure - Web Server Hardware & Software	CLO 1, 2	Group assignment	Lecture presentation, in-class discussion	Reading [1], [2]
10-11	Building an E-commerce Presence	CLO 1,2	Group assignment	Lecture presentation, in-class discussion	Reading [1], [2]
12-13	E-Commerce Security and Payment Systems	CLO 1,2	Group assignment	Lecture presentation, in-class discussion	Reading [1], [2]
14-15	Group project presentation	CLO 2, 3	Project presentation	In-class discussion	
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Process assessment (10%)	Group assignment/Quiz 60% Pass	Group assignment/Quiz 60% Pass	
Group projects (20%)		Group project 80% Pass	Group project 80% Pass
Midterm assessment (30%)	60% Pass	60% Pass	
Final assessment (40%)	60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: ……..** **Date: ……** **Evaluator: ……..**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		

Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

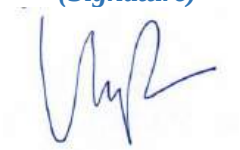
	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the

	supports the presentation or establishes the presenter's credibility/ authority on the topic.	the presentation or establishes the presenter's credibility/ authority on the topic.	the presentation or establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: December 20, 2023

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **Department/School of IEM**

COURSE SYLLABUS

Course Name: Predictive Data Analytics and Applications
Course Code: IS093IU

1. General information

Course designation	
Semester(s) in which the course is taught	
Person responsible for the course	*Please indicate a specific person.*
Language	
Relation to curriculum	*Compulsory / elective / specialisation* *Names of other study programmes with which the module is shared*
Teaching methods	*lecture, lesson, project*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload: 90* *Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60* *Private study including examination preparation, specified in hours[1]: 30*
Credit points	3

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td></td></tr>
<tr><td>Course objectives</td><td>The Predictive Analytics course is aimed at providing knowledge to the students on how to make prediction using machine learning techniques. While scientists are accustomed to make predictions based on consolidated and accepted theories, nowadays big data analytics is able to deliver predictions based on executing a sequence of data processing steps. The course explains both the analytics process as well as the techniques for making predictions.

The course takes a broad predictive analytics project perspective, while identifying some of the key challenges faced, while making predictions. Selected techniques from the information-based and error-based prediction, time series, ANN and deep learning approaches will be studied in the course with supporting examples and use cases.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1: Explain and use the concepts in predictive analytics</td></tr>
<tr><td>Skill</td><td>CLO2: Plan & execute predictive analytics experiment</td></tr>
<tr><td>Attitude</td><td>CLO3: Describe the business situations where & how predictive analytics would, or should, be used. Explain how predictive analytics is used to address organizational needs</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Content</td><td>

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

<table>
<tr><th>Topic</th><th>Weight (hour)</th><th>Level</th></tr>
<tr><td>Intro to Predictive Data Analytics</td><td>2</td><td>I, T</td></tr>
<tr><td>Data to Insights to Decisions</td><td>2</td><td>I, T</td></tr>
<tr><td>Data Exploration</td><td>2</td><td>I, T</td></tr>
<tr><td>Information-Based Learning</td><td>4</td><td>I, T</td></tr>
<tr><td>Similarity-Based Learning</td><td>2</td><td>I, T</td></tr>
<tr><td>Probability-Based Learning</td><td>2</td><td>I, T</td></tr>
<tr><td>Error-Based Learning</td><td>2</td><td>I, T</td></tr>
<tr><td>Deep Learning</td><td>2</td><td>I, T</td></tr>
<tr><td>Evaluation</td><td>2</td><td>I, T</td></tr>
<tr><td>Unsupervised Learning</td><td>2</td><td>I, T</td></tr>
<tr><td>Lab sessions</td><td>15</td><td>I, U</td></tr>
</table>

</td></tr>
<tr><td>Examination forms</td><td>Project and Writing examination</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
<tr><td>Reading list</td><td>[1] John D. Kelleher, Brian Max Namee, Aoife D'Arcy, Fundamentals of Machine Learning for Predictive Data Analytics: Algorithms, Worked examples, and Case Studies. The MIT Press, 2nd edition, 2020.
[2] Valery Manokhin, Practical Guide to Applied Conformal Prediction in Python: Learn and apply the best uncertainty frameworks to your industry applications, Packt Publishing, 2023.</td></tr>
</table>

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-…) and Program/Student Learning Outcomes (SLO) (1 -…) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6

1	x	x				
2			x	x		
3					x	x

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Intro to Predictive Data Analytics	1			
2	Data to Insights to Decisions	1			
3	Data Exploration	1			
4	Information-Based Learning part 1	1			
5	Information-Based Learning part 2	2			
6	Similarity-Based Learning	2			
7	Probability-Based Learning	2			
8	Midterm exam				
9	Error-Based Learning	2			
10	Deep Learning	2			
11	Unsupervised Learning	2			
12	Evaluation models	3			
13	Project presentation	3			
14	Review	3			
15	Final exam	3			

Lab Sessions

10	Exploratory data analysis	3			
11	Common supervised algorithms	3			
12	Common unsupervised algorithms	3			
13	Deep learning	3			
14	Presentation/Review	3			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	… 60%Pass	… 60%Pass	… …%Pass

Project (20%)	… 50%Pass	… 50%Pass	… 50%Pass
Midterm (30%)	… 50%Pass	… 50%Pass	
Final (40%)	… 50%Pass	… 50%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion …:			
Part 2….. (….%)			
Criterion 1 …:			
Criterion …:			
Part 3….. (….%)			
Criterion 1…:			
Criterion …:			
Part ….. (….%)			
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

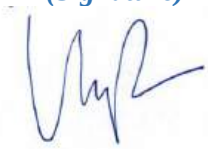
Source: Association of American Colleges and Universities

6. Date revised: 16/12/2023

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering & Management**

COURSE SYLLABUS

Course Name: Smart Manufacturing Systems

Course Code: **IS097IU**

1. General information

Course designation	This course is aimed at introducing foundational concepts and methods of smart manufacturing. This course explores how databases are designed, implemented, used, and maintained, with an emphasis on industrial and commercial applications. To focus on the relational database model and learn the mathematics of structured queries
Semester(s) in which the course is taught	7
Person responsible for the course	
Language	English
Relation to curriculum	
Teaching methods	Lecture, lesson, assignment
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: Contact hours: 45 periods. Private study including examination preparation, specified in hours[1]:
Credit points	3
Required and recommended prerequisites for joining the course	TBD

Course objectives	Impart knowledge of smart manufacturing for industry 4.0 for making student innovative. The students are expected to obtain knowledge of industrial IoT technologies, the ability to design smart manufacturing processes.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Understand application of hardware, communication protocol, IOT platform, machine learning etc. to implement IoT for smart manufacturing for the need of Industry 4.0**
Skill	**CLO2. Find the applications of all the areas & identify different areas of IOT and Smart Manufacturing**
Attitude	**CLO3. To give the exposure on machine learning algorithms and data analytics**

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight (hour)**	**Level**
Industry 4.0	**5**	**I, T**
Artificial Intelligence & Augmented reality in Manufacturing.	**10**	**I, T**
Human-Robot Collaboration, Interoperability	**10**	**I, T**
Data Analytics	**10**	**T, U**
Application Domains	**10**	**T, U**

Examination forms	Writing questions
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed based on their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.

Reading list	1. Gilchrist, A., "*Industry 4.0: the industrial internet of things",* Apress, 2016 2. Rawat, D. B., Brecher, C., Song, H., & Jeschke, S. (2017)., *"Industrial Internet of Things: Cybermanufacturing Systems"*, Springer, 2017. 3. Shalev-Shwartz, S., & Ben-David, S., "*Understanding machine learning: From theory to algorithms",* Cambridge university press, 2014. 4. Masoud Soroush, McKetta Michael Baldea, & Thomas Edgar (2020). *"Smart Manufacturing: Concepts and Methods"*, Elsevier, 2020. 5. Mohiuddin Ahmed (2020), "Blockchain in Data Analytics" Cambridge Scholars. 6. A. A. Jahromi,D. Kundur, (2020)," Fundamentals of Cyber-Physical Systems" White Rose 7. Zhuming Bi, et al, (2022)," Smart Manufacturing" Machines 8. Sudip Misra et al, (2021), "Introduction to Industrial Internet of Things and Industry 4.0" CRC Press. 9. Ales Vysoky, Petr Novak (2016), "Human – Robot Collaboration in Industry.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

3. Planned learning activities and teaching methods.

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Industry 4.0 and Smart Manufacturing	1		Lecture presentation,	Chapter 1, 14 [1], [8]
2	Introduction to IOT and its application in Manufacturing Industry	3	Homework	Lecture presentation, in-class discussion	[2], [6]
3	Smart Design and Fabrication, Cyber-Physical Systems.	3	Homework	Lecture presentation, in-class discussion	[2]
4	Introduction to Blockchain and Application	3	Homework	Lecture presentation, in-class discussion	Chapter 1, 2, 3 [5]
5	Models for Interoperable Human-Robot Collaboration	3	Quiz/Homework	Lecture presentation, in-class discussion	[9]
6	Smart Factory, Cloud Manufacturing and the connected factory, cyber security	3	Quiz/Homework	Lecture presentation, in-class discussion	[4], [7]
7	Artificial Intelligence in Production: Machine Learning Application	3	Homework	Lecture presentation, in-class discussion	Chapter1 [3]
8-9	**MIDTERM**	1, 2			

10	Data Analytics: Introduction, Importance and characteristics of Big Data, Size of Big Data	3	Quiz/Homework	Lecture presentation,	Chapter 1, 2 [3]
11	Data Analytics: Types of analytics, Model Complexity, Over and Under-fitting	3	Quiz/Homework	Lecture presentation, in-class discussion	Chapter 3 [3]
12	Data Analytics: Data Processing prior to Machine Learning, Data Visualization, analytics method, and modelling.	3	Quiz/Homework	Lecture presentation, in-class discussion	Chapter 4 [3]
13	Data Management with Python. Security	3	Homework	Lecture presentation,	Handout
14	Application Domains: Factories and Assembly Line, Food Industry, Healthcare, Power Plants,	3	Assignment/ Project	in-class discussion	Handout
15	Application Domains: Inventory Management & Quality.	3	Assignment/ Project	in-class discussion	Handout
16	Presentation of project	3			
17	Final Exam	3			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes Homework, Assignment, Project. (30%)	Qz, HW 60%Pass	Qz, HW 60%Pass		Qz, HW 60%Pass
Midterm exam (30%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	
Final exam (40%)		Q1 50%Pass	Q 2 50%Pass	Q 3, 4 50%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (65%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant	**15**		

background and prior work			
Analysis and discussion demonstrate good subject mastery	**35**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3.Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.

Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 09/04/2024.

7.

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and anagement

(Signature)

Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Industrial Engineering & Management

COURSE SYLLABUS
Course Name: Decision Analytics
Course Code: IS100IU

1. General information

Course designation	*Decision Analytics*
Semester(s) in which the course is taught	
Person responsible for the course	*Please indicate a specific person.*
Language	English
Relation to curriculum	*Compulsory / elective / specialisation* *Names of other study programmes with which the module is shared*
Teaching methods	*Lecture*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload:* *Contact hours: 45 periods* *Private study including examination preparation, specified in hours[1]:*
Credit points	3
Required and recommended prerequisites for joining the course	Statistics and Probability
Course objectives	To introduce students to key concepts and fundamental approaches in quantitative analysis, and provide a foundation for decision-analytic modeling

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course learning outcomes	

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Apply quantitative tools and analysis to improve decision-making**
Skill	**CLO2. Able to use a collection of tools which are readily applicable in real-world managerial decision making**
Attitude	**CLO3. Have quantitative reasoning ability**

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight (hour)**	**Level**
Decision problem & decision tree	2	T, U
Value of information	2	T, U
Risk & uncertainties	2	T, U
Sensitivity analysis	2	T, U
Probability, Tornado Charts	1	T, U
Random variables dependencies	1	T
Monte Carlo simulation	1	T
Optimization	1	T
System dynamic	2	T,U
Choice Models and Multi-Sided Market	1	I

Topic	**Weight (hour)**	**Level**
Structuring decision problem	1	I, T
The decision matrix	1	I, T, U
Influence Diagrams & Decision Trees	2	I, T, U
Decisions under Ignorance	1	I, T, U
Sensitivity Analysis	1	I, T, U
Probability decisions Optimization	2	I, T, U
Expected Value	1	I, T, U
Utility Theory	1	I, T, U
Decisions under Risk	1	I, T, U
Causal Decision Theory Evidential Decision Theory	1	I, T, U
Game Theory	2	I, T, U
Simulation	1	I, T, U

Examination forms	Exam, Project

Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	[1] Edwards, W., Miles, R. F., & Von Winterfeldt, D. (2007). Advances in decision analysis. Cambridge, New York. [2] Clemen, R. T., & Reilly, T. (2013). Making hard decisions with DecisionTools. Cengage Learning. [3] Peterson, M. (2017). An introduction to decision theory. Cambridge University Press. *Practice: EXCEL*

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) and Program/Student Learning Outcomes (SLO) is shown in the following table:

	SLO						
CLO	1	2	3	4	5	6	7
1	x	x	x		x	x	x
2	x	x		x		x	x
3		x			x		x

Program/Student Learning Outcomes (SLO)

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.*
3. *an ability to communicate effectively with a range of audiences.*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Activities	Resources
1	• Elements of a Decision Problem • Structuring decision problem: defining a decision analytic structure, objectives, attributes. •The decision matrix: states, outcomes, acts, rival formalizations.	1,2,3	Assignments, Quiz	Lectures, Practice	
2	• Review of Probability Distributions • Dependence among Random Variables • Sensitivity Analysis • Tornado Charts	1,2,3	Assignments, Quiz	Lectures, Practice	
3	• Value of Perfect Information • Value of Sample Information	1,2,3	Assignments, Quiz	Lectures, Practice	
4,5	• Identifying Important Uncertainties • Risk Attitudes and Utility Functions • Risk Profiles	1,2,3	Assignments, Quiz	Lectures, Practice	
6,7	• Influence Diagrams • Decision Trees • Decision Theory	1,2,3	Assignments, Quiz Assignments, Quiz Assignments, Quiz	Lectures, Practice Case study Lectures, Practice	
8,9	• Competitive Decision Making • Causual Decision Making • Evidential Decision Making • Modeling Bargaining and Negotiation	1,2,3	Assignments, Quiz	Lectures, Practice	
10,11	• Multiattribute Decision Models • Multiattribute Decision Models under Uncertainties.	1,2,3	Assignments, Quiz	Lectures, Practice	
12	• Group Decision Making	1,2,3	Assignments, Quiz	Case study	
13	• Game Theory	1,2,3	Assignments, Quiz	Lectures, Practice	
14	• Introduction to System Dynamics • Causal Loops • Building and Validating System Dynamics Models	1,2,3	Assignments, Quiz	Lectures, Practice	
15	• Choice Models and Multi-Sided Market	1,2,3	Assignments, Quiz	Lectures, Practice	

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quizzes and homework (15%)	60%Pass	60%Pass	100% Pass
Project (15%)	60%Pass	60%Pass	100% Pass
Midterm Exam (30%)	60%Pass	60%Pass	90% Pass
Final Exam (40%)	60%Pass	60%Pass	90% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Semester Project Report			
Student: …….. HW/Assignment: …….			
Date: …… Evaluator: ……			
	Max.	Score	Comments
Part 1. Problem (25%)			
Criterion 1: Problem Statement	10		
Criterion 2: Objectives of Study	5		
Criterion 3: Scope and Limitations	5		
Criterion 4: Literature Review	5		
Part 2. Proposed System Design and Solution (40%)			
Criterion 1: Proposed System	10		
Criterion 2: Proposed Solution	15		
Criterion 3: New Contribution	15		
Part 3. Results and Validation (35%)			
Criterion 1: Results	15		
Criterion 2: Validation	20		
TOTAL SCORE	100		

5.2.Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3.Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
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Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
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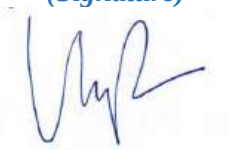
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.

Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 4/12/2023

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: SYSTEMS ENGINEERING

Course Code: **IS035IU**

1. General information

Course designation	**Systems Engineering is the course of methods for developing and analyzing the systems. This course provides the knowledge and skills necessary for the engineers in the development process and systems analysis**
Semester(s) in which the course is taught	**5**
Person responsible for the course	**Dr. Dao Vu Truong Son**
Language	**English**
Relation to curriculum	**Compulsory**
Teaching methods	**Lecture, Exercises, Assignment.**
Workload (incl. contact hours, self-study hours)	**(Estimated) Total workload: 70** **Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45** **Private study including examination preparation, specified in hours[1]: 25**
Credit points	**3**

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	**Nil**
Course objectives	**Systems Engineering is the course of methods for developing and analyzing the systems. This course provides the knowledge and skills necessary for the engineers in the development process and systems analysis (manufacturing and services): systems engineering processes, methods of evaluation, selection and integration of system components, system simulation, and assessment of reliability, availability, and serviceability of the systems.**
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Understand the fundamentals and concepts of systems engineering and analysis. Analyze and evaluate existing systems** **CLO2. Understand and select the necessary components of a system.**
Skill	**CLO3. Use engineering methodology to develop or improve a system**
Attitude	**CLO4. Students will have a positive attitude in both self-learning and group discussion with other disciplines related to engineering mechanic related problems.**

Content	***The description of the contents should clearly indicate the weighting of the content and the level.*** **Weight: lecture session (3 hours)** **Teaching levels: I (Introduce); T (Teach); U (Utilize)**

Topic	Weight	Level
Introduction to Systems Engineering	3	I, T
Conceptual System Design	3	I, T
Preliminary System Design	3	I, T
Detail Design and Development	3	I, T
System Test, Evaluation, and Validation.	3	I, T
Alternatives and Models in Decision Making	3	T, U
Models for Economic Evaluation	3	I, T
Control Concepts and Methods	6	I, T
Design for Reliability	6	I, T
Design for Maintainability	3	I, T
Design for Producibility, Disposability, and Sustainability	3	I, T

Examination forms	**Practice, Writing questions**
Study and examination requirements	**Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.** **Assignments/Examination: Students must have more than 50/100 points overall to pass this course.**
Reading list	**Blanchard B.S., Systems Engineering and Analysis (5ed.), Prentice Hall, 2010.**

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-6) is shown in the following table:

	ILO						
CLO	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	x						
2		x					
3			x	x			
4					x	x	

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	**1.1**	**1.2**	**1.3**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**
1		**1.2a** **1.2b**	**1.3d**	**2.1a** **2.1b**	**2.2a**				
2		**1.2b**	**1.3c**	**2.1a** **2.1b**			**2.4a**	**2.5a**	
3	**1.1b** **1.1c**		**1.3a** **1.3c**					**2.5b**	**2.6a** **2.6b**
4	**1.1c**	**1.2a**	**1.3b** **1.3d**		**2.2b**		**2.4b**	**2.a**	**2.6a**

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	**Introduction to Systems Engineering**	**1,2**	**Exercises, HW, Quiz**	**Lecture, Discussion, HW Inclass-Quiz**	**[1].1**

2	Conceptual System Design	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].2
3	Preliminary System Design	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 3
4	Detail Design and Development	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 4
5	System Test, Evaluation, and Validation.	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 5
6,7	Alternatives and Models in Decision Making	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 6
8	Review		Exercises		
9	Midterm				
10	Models for Economic Evaluation	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 7
11	Control Concepts and Methods	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 8
12	Design for Reliability	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].9
13	Design for Maintainability	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].10
14	Design for Producibility, Disposability, and Sustainability (optional)	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-	[1].11

				Quiz	
15	Project presentation	3,4			
16	Review				
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Project (30%)			50% Pass	50% Pass
Midterm exam (30%)	60% Pass	60% Pass		
Final exam (40%)		60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: …….. Date: …….. Evaluator: ……..			
	Max.	Score	Comments
Technical content (65%)			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	35		
Summary and conclusions appropriate and complete	5		
Organization (10%)			

Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (5%)	**05**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	**Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.**	**Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.**	**Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.**	**Issue/ problem to be considered critically is stated without clarification or description.**

Evidence ***Selecting and using information to investigate a point of view or conclusion***	**Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.**	**Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.**	**Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.**	**Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.**
Influence of context and assumptions	**Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.**	**Identifies own and others' assumptions and several relevant contexts when presenting a position.**	**Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).**	**Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.**
Student's position (perspective, thesis/hypothesis)	**Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).**	**Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.**	**Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.**
Conclusions and related outcomes (implications and consequences)	**Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.**	**Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.**	**Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.**	**Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.**

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.**	**Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.**
Language	**Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language**	**Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is**	**Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in**	**Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to**

	in presentation is appropriate to audience.	**appropriate to audience.**	**presentation is appropriate to audience.**	**audience.**
Delivery	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.**	**Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.**
Supporting Material	**A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.**	**Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.**
Central Message	**Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)**	**Central message is clear and consistent with the supporting material.**	**Central message is basically understandable but is not often repeated and is not memorable.**	**Central message can be deduced but is not explicitly stated in the presentation.**

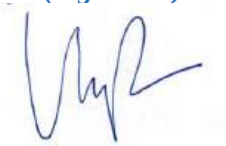
Source: Association of American Colleges and Universities

6. Date revised: April 15, 2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: INTERNATIONAL TRANSPORTATION & LOGISTICS

Course Code: **IS067IU**

1. General information

Course designation	*This course will provide the students with an understanding of both the fundamental role and importance of transportation and logistics in companies and in our society, and the complex environment in which transportation and logistics service is provided today.* *This course takes a managerial approach to teaching transportation and logistics concepts and issues, providing students the tools to adapt to this fast-paced and rapidly changing industry.*
Semester(s) in which the course is taught	7
Person responsible for the course	Assoc. Prof. Dr Ho, Thi Thu Hoa
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, discussion, project.

Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	None
Course objectives	Students will be provided with knowledge and skills of fundamental principles, concepts, operations processes of international transportation and logistics. Students will be able to apply the real-world concepts developed to a range of situations including the workplace and further study in their careers path and lifelong learning.
Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1.** Students will be able to describe key concepts and scope of international transportation and logistics **CLO2.** Students will be able to analyze transportation costing and pricing, carrier strategy, information management and emerging technologies, transportation management strategy and process and propose solutions in the area of international transportation and logistics
Skill	**CLO3.** Students will be able to apply various methods to design international transportation and logistics systems.
Attitude	**CLO4.** Students will have positive attitude in both self-learning and group project with other disciplines related to international transportation and logistics, especially solving related problems.

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Content	***The description of the contents should clearly indicate the weighting of the content and the level.*** Weight: lecture and practice session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	Weight (hour)	Level
Introduction to Transportation and Logistics in Supply Chain ✓ *Transportation and Logistics in Supply chain* ✓ *Global Flows and Trade* ✓ *Economics of Transportation* ✓ *Transportation Planning*	3	I
Costing and Pricing for Transportation ✓ *Market Considerations-Rates vs. Price* ✓ *Cost-of-service Pricing vs. Value-of-service Pricing Economics of Transportation* ✓ *Rate Making in Practice* ✓ *Pricing in Transportation Management*	3	I, T, U
Modes of Transport ✓ *Overview of Transport modes* ✓ *Road transport* ✓ *Rail transport* ✓ *Air transport* ✓ *Maritime transport* ✓ *Inland waterway transport* ✓ *Pipeline* ✓ *Multimodal transport*	9	I, T, U
Private Transportation and Fleet Management ✓ *Private Transportation* ✓ *Modal Types of Private Transportation* ✓ *Private Trucking & Cost Analysis*	3	I, T, U

		Third Party Logistics ✓ *Outsourced Logistics Providers* ✓ *Overview of the 3PL Industry* ✓ *Overview of 3PL Users* ✓ *Establishing and Managing 3PL Relationships* ✓ *Strategic Needs of 3PL Users*	6	I, T, U	
		Global Transportation ✓ *Overview of Global Transportation* ✓ *Global Transportation Planning - Incoterms* ✓ *Global Transportation Execution* ✓ *Issues and Challenges for Global Supply Chains*	6	I, T, U	
		Transportation Risk Management ✓ *The Concept and role of Risk management* ✓ *The Basic Risk Types* ✓ *Transportation Risk Management Process and Techniques* ✓ *Security Regulations and Initiatives*	3	I, T, U	
		Transportation Planning: Supply and Demand ✓ *Transportation Supply* ✓ *Transportation Demand*	3	I, T, U	
		Route choice and static assignment ✓ *Route Choice Models* ✓ *Assignment with Implicit Path Enumeration*	3	I, T	
		Transport Supply Network Design ✓ *Transportation Supply Design Problem* ✓ *Models for Road Network*	3	I, T	

	Layout Design ✓ *Models for Road Network Capacity Design*		
	Group presentation and final exam preparation	3	U

Examination forms	Short-answer questions, Case-answer questions
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	1. Coyle, John J., Robert A. Novack, Brian J. Gibson (2016), *Transportation A global supply chain perspective*, 8th edition. South-Western Cengage, Boston. (Core book) 2. E. Cascetta (2009), *Transportations systems analysis: models and applications*. Springer 3. Alan Harrison and et. (2014), *Logistics management and strategy competing through the supply chain (fifth edition),* Pearson 4. Thorben Seiler (2012), *Operative Transportation Planning Solutions in Consumer Goods Supply Chains*. Springer 5. Rodrigue, J-P., Comitos, C., Slack, B. (2013) *The Geography of Transport Systems*, 3rd ed, Routledge: Albington 6. Incoterms 2020

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-7) is shown in the following table:

	PLO/SLO						
CLO	1	2	3	4	5	6	**7**
1	x						
2		x					
3						x	
4					x		

Student Learning Outcomes

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global,*

cultural, social, environmental, and economic factors

3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a							
2		1.2b		2.1 a 2.1 b					
3		1.2 a	1.3 d					2.5 a	
4	1.1 c		1.3 b						2.6 a

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Transportation and Logistics in Supply Chain	1		Lecture, discussion, Q&A	[1]. Chapter 1
2	Costing and Pricing for Transportation	1,2	HW1.1	Warm up and review, lecture, discussion, Q&A	[1]. Chapter 4
3-4-5	Modes of Transport	1,2	HW1.2	Warm up and review, lecture, discussion, Q&A	[2]. Chapter 5-6-7-8
6	Private Transportation and Fleet Management	1, 2	HW2.1	Warm up and review, lecture, discussion, Q&A	[1]. Chapter 13
7-8	Third Party Logistics	2, 3	HW2.2	Warm up and review, lecture, discussion, role play, Q&A	[1]. Chapter 12

9-10	**Midterm**				
11-12	Global Transportation	3	HW3.1	Warm up and review, lecture, discussion, Q&A	[1]. Chapter 10, 11, 14 [6] Incoterms 2020
13	Transportation Risk Management	1,2	HW3.2	Warm up and review, lecture, discussion, Q&A	[1]. Chapter 9
14	Transportation Planning: Supply and Demand	1,2	HW3.3	Warm up and review, lecture, discussion, Q&A	[2]. Chapter 2-5-9
15	Route choice and static assignment	2, 3	HW4.1	Warm up and review, lecture, discussion, Q&A	[2]. Chapter 5
16	Transport Supply Network Design	2, 3	HW4.2	Warm up and review, lecture, discussion, Q&A	[2]. Chapter 9
17	Group presentation and final exam preparation	3, 4	Presentation	Warm up and review, group work presentation, Q&A	
18	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
In-class assignment (10%)	**HW 1** **60% Pass**	**HW2** **60% Pass**	**HW3-HW4** **60% Pass**	
Group projects (20%)				**Group project** **80% Pass**
Midterm exam (30%)	**60% Pass**	**60% Pass**		
Final exam (40%)		**60% Pass**	**60% Pass**	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: …….			
Date: …… Evaluator: ……			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1

Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence ***Selecting and using information to investigate a point of view or conclusion***	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 04th, 2024

	Ho Chi Minh City, 04/04/2024 ***Dean of School of Industrial Engineering and Management*** ***(Signature)*** ***Assoc. Prof. Dr. Nguyen Van Hop***

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: E-LOGISTICS AND E-SUPPLY CHAIN MANAGEMENT

Course Code: **IS062IU**

1. General information

Course designation	*This course introduces supply chain systems for e-commerce. Topics will cover all aspects of an e-supply chain system from different e-commerce models and e-supply chain structure, demand forecasting, e-procurement, customer segmentation and e-CRM, e-logistics system design, e-manufacturing. E-warehousing and e-fulfillment center, e-shipping and e-distribution system, and some OR applications in e-supply chain problems.*
Semester(s) in which the course is taught	1
Person responsible for the course	*Assoc. Prof. Dr. Nguyen Van Hop*
Language	English
Relation to curriculum	Compulsory
Teaching methods	*lectures, lessons, project, homeworks, quizs.*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload:45* *Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 42 lecture hours* *Private study including examination preparation, specified in hours[1]: 3 hrs for project presentation*
Credit points	3 (5 ECTS)

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td></td></tr>
<tr><td>Course objectives</td><td>This course aims to provide for students:
• To understand the components of an e-supply chain system and how to efficiently manage, coordinate, improve, or design/re-design the whole e-supply chain system or its components;
• To discuss practical issues in e-supply chain management as well as the solutions for such issues;
• To develop skill in applying a variety of techniques to solve e-logistics/supply chain problems.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1. Understanding the e-business models and the components of an e-supply chain system to support running smoothly these business processes. Comparing the differences between the traditional supply chain and the e-supply chain.</td></tr>
<tr><td>Skill</td><td>CLO2. Indentify various issues in e-supply chain systems. Apply diferent optimization and advanced advanced knowledge of natural sciences, mathematics and engineering to solve complex problems arisen in e-Business processes by collecting input data, analyzing parameters, doing literature review, conducting detailed research and experiments, and interpretation of data and solutions.</td></tr>
<tr><td>Attitude</td><td>CLO3. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issues in the working environment.</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (3 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Lecture 1: Introduction to supply chain management in e-Business</td><td>1</td><td>I, T, U</td></tr>
<tr><td>Lecture 2: e-Business models</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Lecture 3: e-CRM</td><td>1</td><td>I, T, U</td></tr>
<tr><td>Lecture 4: e-Procurement</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Lecture 5: e-fulfillment planning</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Lecture 6: e-fuilfillment center</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Lecture 7: e- Delivery: VRP problems</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Lecture 8: e- Delivery: Crowd Shipping problems</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Semester Project</td><td>1</td><td>I, U</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Written Examination</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.
Assignments/ Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
</table>

Reading list	Textbooks: - Lecture Notes + selected journal articles. - Chaffey D. and Hemphill T., Digital business and E-Commerce management, Pearson, 2019. - Ross D. F., Introduction to E-Supply Chain Management: Engaging Technology to Build Market – Winning Business Partnerships, St.Lucie Press, 2003. (e-book, https://www.scribd.com/document/51582619/e-supply-chain-book) - Wang Y. and Pettit S., E-logistics: Managing your digital supply chains for competitive advantage, KoganPage, 2016. References: - Simchi-Levi D., Chen X., and Bramel J., The Logic of Logistics: Theory, Algorithms, and Applications for Logistics Management. Springer Series in Operations Research and Financial Engineering: 2014. - Deborah L. Bayles, *E-commerce Logistics and Fulfillment: Delivering the Goods*, Prentice Hall, 2001. - Graham, D., Manikas, I., and Folinas, D., *E-Logistics and E-Supply Chain Management: Applications for Evolving Business*, 1st edition, IGI Global, 2013. - Adam Robinson, *E-Commerce Logistics: Background & Considerations for Manufacturers & Distributors*, Cerasis, 2016, (e-book, www. http://cerasis.com/category/e-books/) - Janice Reynolds, *Logistics and Fulfillment for E-Business: A Practical Guide to Mastering Back Office Functions for Online Commerce*.CMP Books, 2001 - Dave Chaffey, *E-Business & E-Commerce Management: Strategy, implementation, and practice, 5th ed.* Harlow: Pearson Education Limited, 2011. - Janice Reynolds, *Logistics and Fulfillment for E-Business: A Practical Guide to Mastering Back Office Functions for Online Commerce*.CMP Books, 2001 - Journals: European Journal of Operational Research, Computers & Operations Research, Computers & Industrial Engineering, International Journal of Production Economics, International Journal of Production Research, Expert Systems with Applications, etc.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-…) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	x						x
2	x	x				x	
3			x	x	x		

Intended Learning Outcomes (ILO)

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*

5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a, 1.1b, 1.1c	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a	2.3a	2.4c		
2		1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b		2.4a, 2.4b	2.5a	
3	1.1b,1 .1c		1.3a, 1.3b, 1.3c				2.4b	2.5a, 2.5b	2.6a, 2.6b

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Introduction to supply chain management in e-Business	1	Quiz/HW	Lecture Group forming. Class discussion Read book & lecture 1.	
2&3	Lecture 2: e-Business models	1	Quiz/HW	Lecture Class discussion Read book & lecture 2.	
4	Lecture 3: e-CRM	1	Quiz/HW	Lecture Class discussion Read book & lecture 3.	
5 & 6	Lecture 4: e-Procurement	1	Quiz/HW	Lecture Class discussion Read book & lecture 4.	
7 & 8	Lecture 5: e-fuilfillment center.	1, 2	Quiz/HW	Lecture, Class discussion Read journal articles & lecture 5.	
	Midterm		Written Exam		
9 & 10	Lecture 6: e-fulfillment planning.	1, 2	Quiz/HW	Lecture, Class discussion Read journal articles & lecture 6.	
12 & 13	Lecture 7: e- Delivery: VRP problems	1, 2	Quiz/HW	Lecture, Class discussion Read journal articles & lecture 7.	
14 & 15	Lecture 8: e- Delivery: Crowd Shipping problems.	1, 2	Quiz/HW	Lecture, Class discussion Read journal articles & lecture 8.	
15	Project report and presentation	2,3	Project	Group presentations Class discussion	
	Final exam		Written Exam		

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quizzes and homework (15%)	60%Pass	60%Pass	100% Pass
Project (15%)	60%Pass	60%Pass	100% Pass
Midterm Exam (30%)	60%Pass	60%Pass	90% Pass
Final Exam (40%)	60%Pass	60%Pass	90% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Semester Project Report			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Part 1. Problem (25%)			
Criterion 1: Problem Statement	**10**		
Criterion 2: Objectives of Study	**5**		
Criterion 3: Scope and Limitations	**5**		
Criterion 4: Literature Review	**5**		
Part 2. Proposed System Design and Solution (40%)			
Criterion 1: Proposed System	**10**		
Criterion 2: Proposed Solution	**15**		
Criterion 3: New Contribution	**15**		
Part 3. Results and Validation (35%)			
Criterion 1: Results	**15**		
Criterion 2: Validation	**20**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

Date revised: 04/04/2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Leadership

Course Code: **IS045IU**

1. General information

Course designation	While typical leadership classes leave learners knowing about leadership and other leaders, the course is designed to give students actual access to being a leader and the effective exercise of leadership as their natural self-expression. This is achieved by exploring how listening, speech acts, and language are instrumental to being a leader; identifying blind spots; practicing new ways of being; accepting breakdowns; celebrating breakthroughs; keeping an open mind, rejecting preconceived notions, and being authentic. Topics include authentic listening, integrity, authenticity. Furthermore, students will discover how human brain's neural functioning, listening, and language fundamentally construct what we can perceive and accomplish as leaders in our relationships, organizations, families, and societies.
Semester(s) in which the course is taught	7
Person responsible for the course	Dr. Tran Duc Vi
Language	English
Relation to curriculum	Elective *BA*
Teaching methods	Lecture, project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (lecture): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	None
Course objectives	1. Understand the role of leadership and management. Know important leadership traits and styles. 2. Understand different factors affecting the decision-making process and leadership effectiveness. Apply leadership models in practice. 3. Communicate ideas coherently and effectively.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	Course learning outcome (CLO)
Knowledge	**CLO1 Understand the role of leadership and management and importance of leadership traits, styles.** **CLO2 Understand different factors affecting the decision-making process and leadership effectiveness.**
Skills	**CLO3 Apply leadership models in practice, communicate ideas coherently and effectively.**

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	Weight	Level
Introduction to Leadership	**1**	**I**
Already Always Listening	**1**	**I, T, U**
Trait Approach	**1**	**I, T, U**
Authentic Leadership	**1**	**I, T, U**
Integrity	**2**	**I, T, U**
Skill Approach	**1**	**I, T, U**
Foundation of Leadership	**1**	**I, T, U**
Adaptive Leadership	**1**	**I, T, U**
Behavior – Style Approach	**1**	**I, T, U**
Situational Approach	**1**	**I, T, U**
Power of Context	**1**	**I, T, U**

Examination forms	Writing, project presentation
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	**Textbook:** [1] Northouse, P., 2018. Leadership: Theory and Practice. SAGE Publications **Other required materials:** [2] Erhard, Werner and Jensen, Michael C. and Zaffron, Steve and Zaffron, Steve and Echeverria, Jeronima, Course Materials for: 'Being a Leader and the Effective Exercise of Leadership: An Ontological/Phenomenological Model' (February 1, 2022). Harvard Business School NOM Working Paper No. 09-038, Simon School Working Paper No. 08-03, Barbados Group Working Paper No. 08-02, Available at SSRN: https://ssrn.com/abstract=1263835 or http://dx.doi.org/10.2139/ssrn.1263835

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	x	x				x	
2				x	x	x	x
3			x				

Intended Learning Outcomes (*ABET_Student Outcomes)*
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a, 1.1b, 1.1c	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a	2.3a	2.4c		
2		1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b		2.4a, 2.4b	2.5a	
3	1.1b,1 .1c		1.3a, 1.3b, 1.3c				2.4b	2.5a, 2.5b	2.6a, 2.6b

3. Planned learning activities and teaching methods

Week	Content	CLOs	Assessment	Learning Activities	Resources
1	Introduction	1.1, 1.2	HW	Lecture Project group forming Class Discussion Read Book	[1]
2	Already Always Listening	1.1, 1.2	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
3	Trait Approach	1.1, 1.2	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
4	Authentic Leadership	1.1, 1.2, 2.1	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
5	Integrity Part 1	1.1, 1.2, 2.1	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
6	Integrity Part 2	1.1, 1.2, 2.1	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
7	Skill Approach	1.1, 1.2, 2.1	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
8	Review for Midterm		Quiz	Class Discussion Problem solving	
9	Midterm Exam				
10	Foundation of Leadership	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion Read Book	[1], [2]
11	Adaptive Leadership	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion Read Book	[1], [2]
12	Behavior – Style Approach	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion	[1], [2]

				Read Book	
13	Situational Approach	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion Read Book	[1], [2]
14	Power of Context	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion Read Book	[1], [2]
15	Presentation	2.1, 2.2, 3	Project	Presentation Class Discussion	
16	Review for Final				
17	Final Examination				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Project (14%)	x	x	x
Homework, quiz, reflection (16%)		x	x
Midterm exam (30%)	x	x	x
Final exam (40%)	x	x	x

Note: %Pass: Target 70% of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		

Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 10 April 2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: FLEXIBLE MANUFACTURING SYSTEMS

Course Code: **IS043IU**

1. General information

Course designation	*This subject will provide the concept and method of flexible manufacturing system planning and control. The study covers: FMS technology, component, performance evaluation, and configuration planning.*
Semester(s) in which the course is taught	7
Person responsible for the course	Nguyen Van Chung
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	None
Course objectives	Students will be provided with skills in flexible manufacturing concepts. The terms of Group Technology (GT) and apply GT concepts in a flexible manufacturing environment. Gain insight about the state-of the-art research areas related to FMS and real-time shop floor control; plan and control flexible manufacturing system

[1] When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course learning outcomes	**Upon the successful completion of this course students will be able to:**

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Enable to know flexible manufacturing concepts. Gain insight about the state-of-the-art research areas related to FMS and real-time shop floor control.**
Skill	**CLO2. Define the terms of Group Technology (GT) and apply GT concepts in a flexible manufacturing environment. The components of FMS**
Attitude	**CLO3. To plan and control flexible manufacturing system.**

Content	***The description of the contents should clearly indicate the weighting of the content and the level.*** **Weight: lecture and practice session** **Teaching levels: I (Introduce); T (Teach); U (Utilize)**

Topic	**Content**	**Weight (hour)**	**Level**
Introduction to Flexible Manufacturing Systems	Flexibility; Introduction, Types of FMS FMS Application, Objectives of FMS Chapter 1 (H.K. Shivanand) Chapter 19 (Mikell P. Groover)	1	I, T
Introduction to Flexible Manufacturing Cell	Definition of Cell, Single – station manual/automated Cells, FMC, Differences between FMC and FMS Chapter 2 (H.K. Shivanand) Chapter 13, 14 (Mikell P. Groover)	1	I, T
Group Technology - Part classification – Coding systems	Introduction, Part families, Machine groups, Coding systems. Chapter 4 (H.K. Shivanand) Chapter 18 (Mikell P. Groover)	2	T, U
Group Technology – Production Flow Analysis	Production flow analysis, Benefits of Group Tecnology Chapter 4 (H.K. Shivanand) Chapter 8 (Mikell P. Groover)	2	T, U
Components of FMS	Workstations, Material Handling and storage system, Computer control system, FMC/FMS components Chapter 18, 19 (Mikell P. Groover)	**1**	**T, U**
Midterm Exam			
Automated Material Movement and Storage system	Automation in production systems; Fundamentals and applications of automated production/assembly lines, Analysis of transfer lines, AGV, ASRS, Industrial Robot Chapter 8 (H.K. Shivanand) Chapter 16 (Mikell P. Groover)	**2**	**T, U**
Introduction to FMS software.	Description of General Structure and Requirements, Activities and Functions by FMS Software, Types of FMS Software Modules Chapter 11 (H.K. Shivanand)	2	U
Computer Aided	Introduction to CAPP,	**1**	**T, U**

	Process Planning	Approaches to process planning, Approaches to CAPP Chapter 16 (Mikell P. Groover)		
	Lab: OpenCIM	Operation of openCIM OpenCIM, Intelitek	2	U
	Final Exam			
Examination forms	Answer questions			
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.			
Reading list	[1] H.K. Shivanand, M.M. Benal, V. Koti, *Flexible manufacturing System*, New Age International limited, Publishers, 2006. [2] Mikell P. Groover, *Automation, Production Systems, and Computer-Integrated Manufacturing*, 3rd edition, Prentice Hall, 2007. [3] Horst Tempelmeier, Heinrich Kuhn, *Flexible Manufacturing Systems: Decision Support for Design and Operation*, John Wiley & Sons, 1993. [4] TekLink, CIM Technology 1, OpenCIM, Intelitek, 2003			

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	**7**
1	x						
2				x			
3						x	

Intended Learning Outcomes

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.*
3. *an ability to communicate effectively with a range of audiences.*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment,*

establish goals, plan tasks, and meet objectives.

6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a,1.2b	1.3d	2.1a,2.1b	2.2a				
2	1.1b		1.3c					2.5b	2.6b
3		1.2a	1.3d		2.2b		2.4b	2.5a	

3. Planned learning activities and teaching methods.

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Flexible Manufacturing Systems	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [2]
2	Introduction to Flexible Manufacturing Cell	CLO 1	Quiz	Lecture presentation, in-class discussion	Reading [1] , [2],
3-4	Group Technology - Part classification – Coding systems	CLO 2	Exercises, HW,	Lecture presentation, in-class discussion	Reading [1] , [2]
5-6	Group Technology – Production Flow Analysis	CLO 2	Exercises, HW, Quiz, Assignment	Lecture presentation, in-class discussion	Reading [1] , [2]
7	Components of FMS	CLO 2	Exercises	Lecture presentation, in-class discussion	Reading [2]
8-9	**Midterm**				
10-11	Automated Material Movement and Storage system	CLO 2 CLO 3	Exercises, Quiz	Lecture presentation, in-class discussion	Reading [1], [2]
12	Introduction to FMS software	CLO 2 CLO 3	Exercises	Lecture presentation, in-class discussion	Reading [1], [3]
14-15	Computer Aided Process Planning	CLO 3	Exercises, Assignment	Lecture presentation, in-class discussion	Reading [2]
16-17	Lab: OpenCIM, Robot, ASRS, Lathe, Milling	CLO 3	Practice	Practice	Handout, Reading [4]
18	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class Exercises, quizzes, homework (15%)	Quiz, HW 60% Pass	Quiz, HW 60% Pass	
Assignment, Lab (15%)		80% Pass	
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)		60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response

4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence ***Selecting and using information to investigate a point of view or conclusion***	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

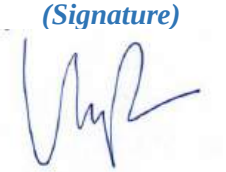
Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: March 30th, 2024.

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering & Management**

COURSE SYLLABUS

Course Name: Advanced Modeling and Prototyping

Course Code: IS098IU

1. General information

Course designation	This course is aimed at introducing foundational concepts of Product structure model as hierarchical classification of items, structural layers; Product data management as an electronic mechanism to achieve information reutilization, product customization and organizational efficiency through managing many products related data; Reverse engineering; Virtual prototype technology and Rapid Prototyping Technology.
Semester(s) in which the course is taught	7
Person responsible for the course	
Language	English
Relation to curriculum	
Teaching methods	Lecture, Lab, Project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: Contact hours: 45 periods. Private study including examination preparation, specified in hours[1]:
Credit points	3

[1] When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td>CAD/CAM/CNC</td></tr>
<tr><td>Course objectives</td><td>To teach students the virtual prototyping, product data management (PDM), reverse engineering (RE) and rapid prototyping (RP) technologies and their applications in product development.</td></tr>
<tr><td>Course learning outcomes</td><td>
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1. Apply principles of product structure modeling and its application in product design and development
CLO2. Understand basic concepts and knowledge of PDM</td></tr>
<tr><td>Skill</td><td>CLO3. Able to employ the computer-aided design (CAD) computer-aided engineering (CAE), rapid prototyping, reverse engineering techniques for prototyping of design concepts</td></tr>
<tr><td>Attitude</td><td>CLO4. Cooperates in group activities</td></tr>
</table>
</td></tr>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.
Weight: lecture session (3 hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight (hour)</th><th>Level</th></tr>
<tr><td>Product Structure Modeling</td><td>3</td><td>T</td></tr>
<tr><td>Product Data Management</td><td>3</td><td>I</td></tr>
<tr><td>Virtual Prototyping</td><td>3</td><td>T, U</td></tr>
<tr><td>Reverse Engineering</td><td>3</td><td>T, U</td></tr>
<tr><td>Rapid Prototyping Technology</td><td>3</td><td>T, U</td></tr>
</table>
</td></tr>
<tr><td>Examination forms</td><td>Writing questions</td></tr>
<tr><td>Study and examination requirements</td><td>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed based on their class participation. Questions and comments are strongly encouraged.
Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</td></tr>
</table>

Reading list	1. Eelco A. Van Veen, Modelling Product structures by Generic Bill-of-Material, 1991, Eindhoven University of Technology. 2. Merja Peltokoski, et al, The role of Product Data Management in engineering design and the key differences between PDM and Product Lifecycle Management, 2014, ResearchGate. 3. Susanna Aromaa, et al, Virtual prototyping in human-machine interaction design, 2014, VTT Technology 185 4. Vinesh Raja, Introduction to Reverse Engineering, 2014, ResearchGate, chapter 1 5. Kumar A, et al, Reverse Engineering in Product Manufacturing: an Overview, 2013, DAAAM International Scientific Book. 6. Kenneth G. Cooper, Rapid Prototyping Technology, 2001, Marcel Dekker *7. Rapid Prototyping, CK Chua, KF Leung, SC Lim, World Scientific, latest edition.* *8. B. Benhabib, Manufacturing: Design, Production, Automation, and Integration, Marcel Dekker, latest edition.* *9. P.N. Rao, CAD/CAM Principles and Applications, McGraw Hill, latest edition.* *10. S. Kalpakian, S. Schmid, Manufacturing engineering and technology, Prentice Hall, latest edition*

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) and Program/Student Learning Outcomes (SLO) is shown in the following table:

	SLO						
CLO	1	2	3	4	5	6	7
1	x	x					
2							x
3		x				x	
4			x		x		

Program/Student Learning Outcomes (SLO)

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.*
3. *an ability to communicate effectively with a range of audiences.*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.*

7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

3. Planned learning activities and teaching methods.

Week	Topic	CLO	Assessments	Learning activities	Resources
1-2	Product Structure Modeling - Product structure concepts. - Product information model. - Product structure Model - Product modeling method. - Case studies	1	Quiz/Homework	Lecture presentation, in-class discussion	[8]
3-4	Product Data Management - Background and basic concepts - PDM systems - PDM for Industry 4.0 - Applications and case studies	2	Quiz/Homework	Lecture presentation, in-class discussion	[2] [8], [10]
5-7	Virtual Prototyping - Background and basic concepts of Virtual Prototyping. - Components of a Virtual Prototyping - Virtual Prototyping implementation to company. - Case examples/studies.	2,3,4	Quiz/Homework, Project	Lecture presentation, in-class discussion Lab CAD/CAM	[9], [3]
8-9	**Midterm**				
10-12	Reverse Engineering - Background ground, and basic concepts. - Basic steps in Reverse Engineering - Applications of RE - Reverse Engineering in Modern Industries	2,3,4	Homework, Project	Lecture presentation, in-class discussion Lab- 3D scanning	[4], [5]
12-14	Rapid Prototyping Technology - Rapid Prototyping Processes - Types of RP technologies - Rapid Prototyping applications - Case studies	2,3,4	Quiz/Homework, Project	Lecture presentation, in-class discussion Lab – 3D printers.	[7], [6]
15	Laboratory - Introduction to CADCAM software - Introduction to 3D scanning - Introduction and using 3D printer	3, 4	Report	Practice	Lab
16	Presentation of Project	4			
17	**Final Exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Exercises/quizzes Homework, Lab (10%)	70%Pass	70%Pass		
Project (20%)			70%Pass	
Midterm Exam (30%)			70%Pass	
Final exam (40%)	70%Pass	70%Pass	70%Pass	70%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (65%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**35**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 09/04/2024

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and anagement
(Signature)

Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **Department/School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Industrial Process and System Data Analysis and Modelling

Course Code: **IS101IU**

1. General information

Course designation	
Semester(s) in which the course is taught	
Person responsible for the course	*Please indicate a specific person.*
Language	English
Relation to curriculum	*Compulsory / elective / specialisation* *Names of other study programmes with which the module is shared*
Teaching methods	*lecture, lesson, project*
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 75 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): (45 lecture) Private study including examination preparation, specified in hours: 30
Credit points	3
Required and recommended prerequisites for joining the course	Recommended:

<table>
<tr><td>Course objectives</td><td>Process and system data analysis and modelling is one of the key aspects of process systems engineering. It is a significant activity in most major companies around the world, driven by applications such as process optimization, design, and control. It presents a systematic approach to modelling covering model formulation, documentation, analysis, solution, and validation. Process models depend not only on the process itself, but also on the modelling goal. This course therefore, places its main emphasis on process and system data analysis and modelling for dynamic simulation and process control purposes. This course introduces a structured modelling methodology emphasizing the importance of the modelling goal and including key steps such as model verification, calibration, and validation. Focuses on novel and advanced modelling techniques such as discrete, hybrid, hierarchical, and empirical modelling. Illustrates the notions, tools, and techniques of process modeling with examples and advances applications.</td></tr>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1 Students will gain deep understanding of the basic process and system data analysis and modelling techniques.</td></tr>
<tr><td>Skill</td><td>CLO2 Students will apply their knowledge to design solutions to different problems.</td></tr>
<tr><td>Attitude</td><td>CLO3 Students will have the ability to model and analyze process and system for a selected application.</td></tr>
</table></td></tr>
</table>

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight (hour)**	**Level**
A systematic approach to model building	**3**	**I, T**
Conservation principles	**3**	**I, T**
Constitutive relations	**3**	**I, T**
Dynamic models—Lumped parameter systems	**3**	**I, T**
Solution strategies for lumped parameter models	**3**	**T, U**
Dynamic models—Distributed parameter systems	**3**	**T, U**
Solution strategies for distributed parameter models	**3**	**T, U**
Process model hierarchies	**3**	**T, U**
Basic tools for process model analysis	**3**	**T, U**
Data acquisition and analysis	**3**	**T, U**
Statistical model calibration and validation	**3**	**T,U**
Analysis of dynamic process models	**3**	**T,U**
Process modelling for control and diagnostic purposes	**3**	**T,U**
Modelling discrete event systems	**3**	**T,U**

Examination forms	Project and Writing examination
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	*Processing Modelling and Model Analysis, 1st Ed., Academic Press, Year: 2001* *Modern Structural Analysis: Modelling Process and Guidance, ThomasTelford, Year 2005*

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-…) and Program/Student Learning Outcomes (SLO) (1 -…) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	A systematic approach to model building	1		T	Py-pde
2	Conservation principles	1		T	Py-pde
3	Constitutive relations	1		T	Py-pde
4	Dynamic models—Lumped parameter systems	2		T	Py-pde
5	Solution strategies for lumped parameter models	2	HW2	T	Py-pde
6	Dynamic models—Distributed parameter systems	2		T	Py-pde
7	Solution strategies for distributed parameter models	2		T	Py-pde
8	Midterm				
9	Process model hierarchies	1	HW3	T,U	
10	Basic tools for process model analysis	1		T,U	
11	Data acquisition and analysis	1		T,U	
12	Statistical model calibration and validation	1		T	
13	Analysis of dynamic process models	1	HW4	T	
14	Process modelling for control and diagnostic purposes	1		T	
15	Modelling discrete event systems	1		T	Arena
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	… 60%Pass	… 60%Pass	… …%Pass

Project (20%)	… 50%Pass	… 50%Pass	… 50%Pass
Midterm (30%)	… 50%Pass	… 50%Pass	
Final (40%)	… 50%Pass	… 50%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. **HW/Assignment: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Part 1….. (….%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion …:			
Part 2….. (….%)			
Criterion 1 …:			
Criterion …:			
Part 3….. (….%)			
Criterion 1…:			
Criterion …:			
Part ….. (….%)			
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response

4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

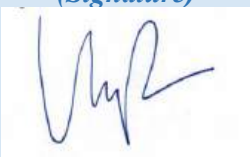
Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 15/04/2024

	Ho Chi Minh City, 26/04/2024 ***Dean of School of Industrial Engineering and Management*** ***(Signature)***  ***Assoc. Prof. Dr. Nguyen Van Hop***

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Industrial Engineering and Management

COURSE SYLLABUS

Course Name: Retail Management

Course Code: **IS082IU**

1. General information

Course designation	*This subject will provides the student with a comprehensive view of retailing and an application of marketing concepts in a practical retail managerial environment. As a potential marketing manager, this course will give students insight into the retailing environment of which students will be a part and allow students to make informed decisions in your interaction with retailers. The course also provides a good foundation for those interested in owning or running a small retail business or those interested in pursuing a retail career as a merchandise buyer or store manager.*
Semester(s) in which the course is taught	5
Person responsible for the course	Dr. Nguyen Hang Giang Anh
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, project.

Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, etc.): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3
Required and recommended prerequisites for joining the course	None
Course objectives	Students will be provided with skills of using data from a variety of sources, be introduced to basic retailing principles and the scope of retailing and current technology along with future trends in the retailing. Through this unit, students will able to build a Retail Store, will take the student from learning concepts to the application of the concepts through the creation of a retail concept and marketing plan. Industry professionals will provide students with real world experiences in this process.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1. Understand basic retailing principles and the scope of retailing. CLO2. Understand current technology along with future trends in the retailing.
Skill	CLO3. Able to build a Retail Store, will take the student from learning concepts to the application of the concepts through the creation of a retail concept and marketing plan. Industry professionals will provide students with real world experiences in this process.
Attitude	CLO4. Reason around ethical and privacy issues in this course conduct and apply ethical practices.

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Content</td><td>

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Introduction to the world of retailing</td><td>1</td><td>I, T</td></tr>
<tr><td>Types of retailers</td><td>1</td><td>I, T, U</td></tr>
<tr><td>Digital Retailing + Multichannel & Omnichannel retailing</td><td>2</td><td>I, T</td></tr>
<tr><td>Customer buying behavior</td><td>2</td><td>I, T</td></tr>
<tr><td>Retail locations</td><td>1</td><td>I, T, U</td></tr>
<tr><td>Retail site location</td><td>1</td><td>I, T</td></tr>
<tr><td>Retail Market Strategy + Financial strategy</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Managing Merchandise Process</td><td>1</td><td>I, T</td></tr>
<tr><td>Retail pricing</td><td>1</td><td>I, T</td></tr>
<tr><td>Store layout and design</td><td>1</td><td>I, T</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

</td></tr>
<tr><td>Examination forms</td><td>Answer questions, exercises.</td></tr>
<tr><td>Study and examination requirements</td><td>

Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

Assignments/Examination: Students must have more than 50/100 points overall to pass this course.

</td></tr>
<tr><td>Reading list</td><td>

[1] Retailing Management, 11th Edition. New York: McGraw-Hill/Irwin. Levy, Michael, Barton A. Weitz, Dhruv Grewal, 2022.

[2] Retailing, 7th Edition. Cengage Learning, Patrick M. Dunne, Robert F. Lusch, James R. Carver, 2010.

[3] Logistics and Retail Management: Emerging Issues and New Challenges in the Retail Supply Chain, 5th Edition. Kogan Page. John Fernie, Leigh Sparks, 2019.

[4] Retail Management: A Strategic Approach, 13th Edition. Pearson. Barry Berman, Joel R. Evans, 2018.

</td></tr>
</table>

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (PLO/SLO) (1-7) is shown in the following table:

	PLO/SLO						
CLO	1	2	3	4	5	6	7
1				x			x
2					x		
3		x					
4				x			

ABET Student Outcomes

Criteria for Accrediting Engineering Programs, 2020-2021

1. *An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.*
2. *An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.*
3. *An ability to communicate effectively with a range of audiences.*
4. *An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.*
5. *An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.*
6. *An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.*
7. *An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to the world of retailing	1, 2		Lecture presentation, in-class discussion	Reading [1], [2], [3], [4] and Teaching Material
2	Types of retailers	1, 2	Quiz/HW	Lecture presentation, in-class discussion	Reading [1] and Teaching Material
3-4	Digital Retailing + Multichannel & Omnichannel Retailing	1, 2	Quiz/HW	Lecture presentation, in-class discussion	Reading [1], [4] and Teaching Material
5-6	Customer buying behavior	1, 2	Quiz/HW	Lecture presentation, in-class discussion	Reading [1], [2] and Teaching Material

7	Retail locations	1, 2	Quiz/HW	Lecture presentation, in-class discussion	Reading [1], [2], [4] and Teaching Material
8	Retail site location	1, 2	Quiz/HW	Lecture presentation, in-class discussion	Reading [1], [2], [4] and Teaching Material
9-10	**Midterm Exam**				
11-12	Retail Market Strategy + Financial strategy	1, 2	Quiz/HW	Lecture presentation, in-class discussion	Reading [1], [2], [4] and Teaching Material
13	Managing Merchandise Process	1, 2	Quiz/HW	Lecture presentation, in-class discussion	Reading [1], [3], [4] and Teaching Material
14	Retail pricing	1, 2	Quiz/HW	Lecture presentation, in-class discussion	Reading [1], [2] and Teaching Material
15	Store layout and design	1, 2	Quiz/HW	Lecture presentation, in-class discussion	Reading [1], [2], [4] and Teaching Material
16-17	Group Project Presentation	3,4			
18	**Final Exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Group Project (20%)			Group project 60% Pass	Group project 60% Pass
In-class assignment (10%)	Quiz/HW 60% Pass	Quiz/HW 60% Pass		
Midterm exam (30%)	50% Pass	50% Pass		
Final exam (40%)	50% Pass	50% Pass		

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: ……..	HW/Assignment: …….		
Date: ……	Evaluator: ……		
	Max.	**Score**	**Comments**

Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
Presentation (20%)			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.

Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: Dec 24, 2023

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and anagement
(Signature)

Dr. Nguyen Van Hop

VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Industrial Engineering and Management

COURSE SYLLABUS

Course Name: Data Mining in Supply Chain

Course Code: **IS066IU**

1. General information

Course designation	An overview of business intelligence in the field of supply chain management and marketing. Addresses how to leverage business intelligence systems to define KPIs, sharpen the accuracy of forecasting and planning, track business activities, and deliver dashboards, scorecards, strategic reporting, and operational/real-time reporting to enhance decision making for supply chain and marketing.
Semester(s) in which the course is taught	5
Person responsible for the course	Dr. Dao Vu Truong Son
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, Exercises, Assignment.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours[1]: 25
Credit points	3

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Required and recommended prerequisites for joining the course	Nil
Course objectives	Understand the business intelligence in the field of supply chain management and marketing. Addresses how to leverage business intelligence systems to define KPIs, sharpen the accuracy of forecasting and planning, track business activities, and deliver dashboards, scorecards, strategic reporting, and operational/real-time reporting to enhance decision making for supply chain and marketing.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1. Understand major principles and concepts of data mining CLO2. Select and apply data mining algorithms to build analytical applications
Skill	CLO3. Use dedicated tool for data mining applications
Attitude	CLO4. Students will have positive attitude in both self-learning and group discussion with other disciplines related to data mining for supply chain.

Content

The description of the contents should clearly indicate the weighting of the content and the level.

Weight: lecture session (3 hours)

Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Introduction to Data Mining	3	I, T
Data preprocessing	3	I, T
Data Warehousing and Online Analytical Processing	3	I, T
Data Cube Technology	6	I, T
Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and Methods	6	I, T
Developing Business Intelligence and Market Intelligence	6	I, T
Supply Market Intelligence	6	I, T
Developing Sourcing Strategy	3	I, T
Benchmarking	3	I, T, U

Examination forms	Practice, Writing questions

Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	"Data Mining: Concepts and Techniques, 3rd Edition", Jiawei Han; Micheline Kamber; Jian Pei, Morgan Kaufmann

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	x					
2		x				
3			x	x		
4					x	x

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to DataMining	1	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].1
2	Data preprocessing	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].2
3	Data Warehousing and Online Analytical Processing	2,3	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 3
4,5	Data Cube Technology	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 4,5
6,7	Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and Methods	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 6,7
8	Review		Exercises		
9	Midterm				
10,11	Developing Business Intelligence and Market Intelligence	1,2,4	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].10
12,13	Supply Market Intelligence	3,4	Exercises, HW, Quiz	Lecture, Discussion, Inclass-Quiz	[1].12
14	Developing Sourcing Strategy	3,4	Exercises, HW, Quiz	Lecture, Discussion, Inclass-Quiz	[1].13

16	Project presentation	3, 4			
17	Review				
18	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class assignment (10%)	HW 1 60% Pass	HW2 60% Pass	HW3-HW4 60% Pass	
Project (20%)			60% Pass	60% Pass
Midterm exam (30%)	60% Pass	60% Pass		
Final exam (40%)		60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. Date: …… Evaluator: ……			
	Max.	**Score**	**Comments**
Technical content (65%)			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	35		
Summary and conclusions appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
Presentation (20%)			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
Quality of Layout and Graphics (5%)	05		

TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 15, 2022

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Internship 1

Course Code: IS052IU

1. General information

Course designation	*This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning.*
Semester(s) in which the course is taught	1,2,3
Person responsible for the course	*MSc. Duong Vo Nhi Anh.*
Language	English
Relation to curriculum	*Compulsory*
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload: 70* *Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45* *Private study including examination preparation, specified in hours[1]: 25* *A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor).*
Credit points	2
Required and recommended prerequisites for joining the course	None
Course objectives	The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering.

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<table>
<tr><td>Course learning outcomes</td><td>Upon the successful completion of this course students will be able to:
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1. Students apply specialized knowledge through observing the operating processes of real companies.
CL02. Students have Academic research and writing: Empiricism understanding, methods of academic research and writing</td></tr>
<tr><td>Skill</td><td>CLO3. Students are able to identify, abstract and structure technical and economic tasks and problems.</td></tr>
<tr><td>Attitude</td><td>CLO4. Students will have integrative knowledge of soft skills, practical knowledge and foreign language.</td></tr>
</table></td></tr>
<tr><td>Content</td><td>The description of the contents should clearly indicate the weighting of the content and the level.

Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor). Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company.</td></tr>
<tr><td>Examination forms</td><td>Report</td></tr>
<tr><td>Study and examination requirements</td><td>Class Participation: Students must complete the following forms and requirements:

- Internship Registration: register internship through Edu soft or form.

- Internship Application and Student Performance Record.

- Supervisor & Advisor Evaluations: This questionnaire helps ensure that the ISE receives a complete and fair assessment of each student’s performance from the site supervisor and advisor. At the completion of the internship, students are responsible for requesting their site supervisor and advisor to complete, and send this form to their advisor and then submit to the Program Assistant.

- Final Report: In order to receive credit and a final grade for an approved internship students, must submit the final report. See below for suggested final report requirements. This report is to be completed by the student and must be submitted to the Program Assistant no later than the due date (to be defined later). 10 points will be deducted from your final grade when the final report is submitted late.

Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Fabrication (Falsifying or inventing any information, citation, or data) or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade. For this class, all reports are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.</td></tr>
</table>

Reading list	

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	**x**						**x**
2	**x**						
3						**x**	
4				**x**			**x**

Intended Learning Outcomes

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a 1.1b 1.1c	1.2a 1.2b	1.3c, 1.3d	2.1b 2.1a	2.2a	2.3a	2.4c		
2		1.2a 1.2b	1.3d	2.1a, 2.1b	2.2a				
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4	1.1a		1.3c			2.3a	2.4c		2.6a

	1.1b 1.1c								

3. Planned learning activities and teaching methods

Day	Content	CLOs (Gx.x)	Teaching and Learning activities		Assessment Activities
			Lecture	Student	
1	**Lecture 1: Observation factory 1**	**CLO1,2,3,4**	**Lecture**	**Group forming**	**Quiz**
2	**Lecture 2: Observation factory 2**	**CLO1,2,3,4**	**Lecture**	**Group forming**	**Quiz**
3	**Lecture 3: Observation factory 3**	**CLO1,2,3,4**	**Lecture**	**Group forming**	**Quiz/HW**
4	**Lecture 4: Observation factory 4**	**CLO1,2,3,4**	**Lecture**	**Group forming**	**Quiz/HW**
5	**Lecture 5: Observation factory 5**	**CLO1,2,3,4**	**Lecture**	**Group forming**	**Homework**
Final report					

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quizzes and homework (15%)	60%Pass	60%Pass	60%Pass	60%Pass
Project (15%)	60%Pass	60%Pass	60%Pass	60%Pass
Midterm Exam (30%)	60%Pass	60%Pass	60%Pass	60%Pass
Final Exam (40%)	60%Pass	60%Pass	60%Pass	60%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: ……..	**HW/Assignment: …….**		
Date: ……	**Evaluator: ……**		
	Max.	**Score**	**Comments**

Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		
Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

Evidence ***Selecting and using information to investigate a point of view or conclusion***	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

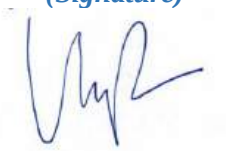
	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and

	polished and confident.	comfortable.	speaker appears tentative.	speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 10, 2024

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)



Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: Internship 2

Course Code: IS053IU

1. General information

Course designation	*This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering.*
Semester(s) in which the course is taught	3
Person responsible for the course	*MSc. Duong Vo Nhi Anh.*
Language	English
Relation to curriculum	*Compulsory*
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	*A minimum of 320 working hours or 40 working days is required.*
Credit points	3
Required and recommended prerequisites for joining the course	None
Course objectives	**Student will be able to have practical work experience under supervision and guidance, have ability to apply theories and principles learned in academic coursework to specific situations with the internship experience, ability to learn by observing and analyzing the daily functioning of the work place and reflecting on how people within the organization carry out its mission, get motivated and confident about career options after graduating.**

Course learning outcomes	Upon the successful completion of this course students will be able to: **Competency level** / **Course learning outcome (CLO)** **Knowledge** — **CLO 1. Students will be able to understand different kinds of production and the background and philosophies of lean production, method to analyze existing systems and identify different kinds of waste.** **Skill** — **CLO 2. Students will be able to identify, abstract, and apply approaches used in implementing lean production such as 5S, stability, pull production, cellular arrangement and layout improvement, quick change** **Attitude** — **CLO 3. Students will have integrative knowledge of soft skills and foreign language, total productive maintenance, mistake reduction, standards, leveling, visual management to real-life problems**
Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 320 working hours or 40 working days is required. Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company. Students should be both supported and challenged and encouraged to take initiative and develop life-long learning skills. Each intern works under a site supervisor at the host organization and an advisor from IU (ISE's lecturer). The role of the site supervisor (or advisor) is to oversee the students and provide mentorship throughout the internship. The site supervisor and advisor will complete a performance evaluation form at the conclusion of the internship. Students will discuss their experiences through weekly reports and online discussions.
Examination forms	Report
Study and examination requirements	*Report:* Students must have more than 50/100 points overall to pass this course. *Attendance:* A minimum of 320 working hours or 40 working days is required.
Reading list	

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	x						
2	x	x				x	
3					x		x

Intended Learning Outcomes
Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2a 1.2b	1.3c 1.3d	2.1a, 2.1b	2.2a		2.4a, 2.4b	2.5a	
3	1.1a 1.1b, 1.1c		1.3b 1.3c			2.3a	2.4c		2.6a

3. Planned learning activities and teaching methods

Week	**Content**	**CLOs (Gx.x)**	**Teaching and Learning activities**		**Assessment Activities**
			Supervisor	**Student**	
1,2,3	**Observation analysis and find out problem 1**	**CL01, 02,03**	**presentation**	**Class discussio n**	**Quiz/HW**
4,5,6	**Observation analysis and**	**CL01, 02,03**	**presentation**	**Class discussio**	**Quiz/HW**

	find out problem 2			**n**	
7,8,9	**Observation analysis and find out problem 3**	**CL01, 02,03**	**presentation**	**Class discussio n**	**Quiz/HW**
10,11 ,12	**Observation analysis and find out problem 4**	**CL01, 02,03**	**presentation**	**Class discussio n**	**Quiz/HW**
Final report					

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Quizzes and homework (15%)	60%Pass	60%Pass	60%Pass
Project (15%)	60%Pass	60%Pass	60%Pass
Midterm Exam (30%)	60%Pass	60%Pass	60%Pass
Final Exam (40%)	60%Pass	60%Pass	60%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: …….. HW/Assignment: ……. **Date: …… Evaluator: ……**			
	Max.	**Score**	**Comments**
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	**10**		
Introduction demonstrates thorough knowledge of relevant background and prior work	**15**		
Analysis and discussion demonstrate good subject mastery	**30**		
Summary and conclusions appropriate and complete	**5**		
Organization (10%)			
Distinct introduction, body, conclusions	**5**		
Content clearly and logically organized, good transitions	**5**		

Presentation (20%)			
Correct spelling, grammar, and syntax	**10**		
Clear and easy to read	**10**		
Quality of Layout and Graphics (10%)	**10**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 12, 2024

Ho Chi Minh City, 26/04/2024
Dean of School of Industrial Engineering and Management
(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: CAPSTONE DESIGN

Course Code: **IS083IU**

1. General information

Course designation	*This subject is a preparation step for thesis and helps student to review their jobs after internship 2. It also helps students know how to identify the problem, review related literatures, and develop initial system for solving the current problem of a case.*
Semester(s) in which the course is taught	2
Person responsible for the course	Assoc. Prof. Nguyen Van Hop
Language	English
Relation to curriculum	Compulsory
Teaching methods	Project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 137.5 Contact hours: 37.5) Private study including report and presentation preparation, specified in hours[1]: 100
Credit points	3 (5 ECTS)
Required and recommended prerequisites for joining the course	

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	Capstone project is a semester-long course taken at the senior year. Students engage in a research project focused on economic, social and environmental problems to study a current system, identify the possible problem, and explore in literature published research achievements in a research field that students have already agreed upon with potential thesis advisors in order to support and develop in thesis later. This research is individual work. Students and advisors meet to discuss together as much as needed. In the result, students have to develop a prototype module or system with the basic level requirements that it can improve and develop in the thesis.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	
Skill	**CLO1. Know how to study a current system. Know how to identify a specific problem that related to the economic, social and environmental consideration.** **CLO2. Apply engineering methods and holistic and systematic approaches to formulate and solve practical problem. Be able to conduct literature review related to the specific topic, collect sources information and analyze parameters, evaluate, choose, and apply adequate methods of modeling, simulation, design and implementation of technical and economic systems. Be able to develop a prototype system or an intial solution of the problem and conduct experiments and analyze the solutions using optimization tools and advanced knowledge of natural sciences, mathematics and engineering.**
Attitude	**CLO3. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issues in the working environment.. No cheating, regular meetings, team working, on-time reports. Be able to report and defend their research in both writing and speaking format.**

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Select the research topics and determine the case study.	1 hr	I, U
Identify the specific problem, objective of study and scopes.	3 hrs	I, U
Search the related papers in research field and make literature review.	6 hrs	I, U
Develop the system to figure out the solution for the studied problem	8 hrs	U
Implement the solution method	12 hrs	U
Data collection and validate the proposed system.	12 hrs	U
Write a final report and make presentation.	3 hrs	U

Examination forms	Presentation, Report.
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the weekly meetings. Students will be assessed on the basis of their working outputs. Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	Textbooks: - Depending on specific problems References: - Published scientific articles and technical documents

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1	x			x			
2	x	x				x	x
3			x	x	x		

Intended Learning Outcomes (ILO)

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider*

the impact of engineering solutions in global, economic, environmental, and societal contexts

5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1b	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	**2.2a**			2.5b, 2.6b	
2	**1.1a,1.1b,1.1c**	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b	**2.3a**	2.4c		
3	1.1b,1.1c		1.3a, 1.3b,1.3c					2.5b	2.6a, 2.6b

3. Planned learning activities and teaching methods

It depends on the individual work between students and advisors, including main contents:

1. Select the research topics and find out the specific problem.
2. Identify the specific problem in each situation and proposed methods.
3. Search the related papers in research field and make literature review.
4. Test the proposed system with small size problem.
5. Write a final report and make presentation.

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Final Report (80%)	Final Report 60%Pass	Final Report 60%Pass	Final Report 60%Pass
Final Presentation (20%)	60%Pass	60%Pass	Final Presentation 60%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist			
Student: …….. Topic: …….			
Date: …… Evaluator: ……			
	Max.	Score	Comments
Chapter 1: Introduction (15%)			
Criterion 1: Problem statement	5		
Criterion 2: Objectives of Study	5		
Criterion 3: Scope and Limitations	5		
Chapter 2: Literature Review (15%)			
Criterion 1: Current System	2		
Criterion 2: Related Works	10		
Criterion 3: Research Gap(s) and Key Ref.	3		
Chapter 3: Proposed System (30%)			
Criterion 1: Methodology Selection	15		
Criterion 2: Proposed Solution	15		
Chapter 4: Implementation and Validation (30%)			
Criterion 1: Solution Implementation	15		
Criterion 2: Validation	15		
Chapter 4: Report and Presentation (10%)			
Criterion 1: Report	5		
Criterion 2: Presentation	5		
TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are

	included.
2	**Demonstrates little understanding of the problem. Many requirements of task are missing.**
1	**Demonstrates no understanding of the problem.**
0	**No response/task not attempted**

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	**Milestone**		**Benchmark**
	4	**3**	**2**	**1**
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	**3**	**2**	**1**
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 10/5/2022

Ho Chi Minh City, 10/05/2022
Dean of School of Industrial Engineering and Management
(Signature)

Dr. Nguyen Van Hop

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** **School of Industrial Engineering and Management**

COURSE SYLLABUS

Course Name: THESIS RESEARCH

Course Code: **IS048IU**

1. General information

Course designation	*This subject is a comprehensive study to develop problem solving skills for students. It also helps students know how to identify the problem, review related literatures, design a system for solving the problem, improve the current system, validate and analyze the results, and utilize all related knowledge to solve efficiently the problem..*
Semester(s) in which the course is taught	1, 2
Person responsible for the course	Assoc. Prof. Nguyen Van Hop
Language	English
Relation to curriculum	Compulsory
Teaching methods	Project
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 45 Contact hours: 15 (advising discussion) Private study including report and presentation preparation, specified in hours[1]: 30
Credit points	10
Required and recommended prerequisites for joining the course	

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	Thesis project is a semester-long, individual study taken at the last semester of the senior year. Students are required to solve a large-scale problem by designing a new system or developing a comprehensive solution to improve the current system. The new design or solution for improvement must take into account realistic constraints such as economic, social and environmental conditions.
Course learning outcomes	Upon the successful completion of this course students will be able to:

Competency level	**Course learning outcome (CLO)**
Knowledge	**CLO1. Know how to study a system. Know how to identify a specific problem that related to the economic, social and environmental consideration.**
Skill	**CLO2. Apply engineering methods and holistic and systematic approaches to formulate and solve practical problem. Be able to conduct literature review related to the specific topic, collect sources information and analyze parameters, evaluate, choose, and apply adequate methods of modeling, simulation, design and implementation of technical and economic systems. Be able to design a new system or develop a solution to improve the current system in a large scale, subject to complicated and realistic constraints (economic, social and environmental) and conduct experiments and analyze the solutions using optimization tools and advanced knowledge of natural sciences, mathematics and engineering.**
Attitude	**CLO3. No cheating, regular meetings, on-time reports. Develop soft and professional skills (communication, decision making, organize, plan, and manage the projects) and apply ethical practices to handle issues in the working environment. Be able to report and defend their research in both writing and speaking format.**

Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	**Weight**	**Level**
Identify the problem, objectives, scope and limitation	**1 hr**	**I, U**
Conduct literature review and study related theory	**4 hrs**	**I, U**
Develop the system to figure out the solution for the studied problem	**3 hrs**	**U**
Propose research plan and Proposal defense	**1 hr**	**U**
Investigate the current system by identifying all of its inputs, outputs and realistic constraints, including economics, social and environmental to determine areas for improvement	**12 hrs**	**U**
Design a new system or develop improvement solution to improve the system in a large scale with those complicated and realistic constraints.	**12 hrs**	**U**
Implement the current and improvement systems	**6 hrs**	**U**
Data collection and validate the proposed solutions	**3 hrs**	**U**
Write a final report and make presentation.	**3 hrs**	U

Examination forms	Presentation, Report.
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/ Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	*Textbooks and Lecture Notes of related courses, scientific articles in research databases such as sciencedirect, Ieeexplore,Springer,etc.*

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-…) and Intended Learning Outcomes (ILO) (1-3) is shown in the following table:

	PLO/SLO						
CLO	1	2	3	4	5	6	7
1	x			x			
2	x	x				x	x
3			x	x	x		

Intended Learning Outcomes (ILO)

Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*

2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

8. The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1b	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a			2.5b	
2	1.1a, 1.1b, 1.1c	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b	2.3a	2.4c		
3	1.1b, 1.1c		1.3a 1.3b 1.3c					2.5b	2.6a 2.6b

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Identify the thesis problem: problem statement, objectives of study, scope and limitations	1	Report	Lecture advices Self-study and research	Internship 2 case study
2	Conduct current system process and literature review	1	Report	Lecture advices Self-study and research	Scientific databases
3	Identify research gap and proposed the solution system	1,2,7	Report	Lecture advices Self-study and research	
4	Propose research plan and Proposal defense	1	Report	Lecture advices Self-study and research	
5	Investigate the current system by identifying all of its inputs, outputs and realistic constraints, including	1,4	Report	Lecture advices Self-study and research	

	economics, social and environmental to determine areas for improvement				
6	Design a new system or develop improvement solution to improve the system in a large scale with those complicated and realistic constraints.	1,2,7	Report	Lecture advices Self-study and research	
7	Midway report		Midway report		
8	Implement the current and improvement systems	1, 2,7	Report	Lecture advices Self-study and research	
9	Data collection and validate the proposed solutions	6	Report	Lecture advices Self-study and research	
10	Final report and defense		Final Report		

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO4	CLO6	CLO7
Midway Report (20%)	Midway Report 60%Pass	Midway Report 60%Pass	60%Pass	0%Pass	60%Pass
Final Report (80%)	Final Report 60%Pass	Final Report 60%Pass	60%Pass	60%Pass	60%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist			
Student: …….. **Topic: …….** **Date: ……** **Evaluator: ……**			
	Max.	**Score**	**Comments**
Chapter 1: Introduction (10%)			
Criterion 1: Problem statement	**5**		
Criterion 2: Objectives of Study	**2**		
Criterion 3: Scope and Limitations	**3**		
Chapter 2: Literature Review (10%)			
Criterion 1: Current System	**2**		
Criterion 2: Related Works	**5**		
Criterion 3: Research Gap(s) and Key Ref.	**3**		
Chapter 3: Proposed System (20%)			

Criterion 1: Methodology Selection	**10**		
Criterion 2: Proposed Solution	**10**		
Chapter 4: Current System (15%)			
Criterion 1: Current Implementation	**10**		
Criterion 2: Areas for improvement	**5**		
Chapter 5: Improvement System (20%)			
Criterion 1: Proposed Improvement Solution	**10**		
Criterion 2: Implementation for Improvement Solution	**10**		
Chapter 6: Data Collection and Validation (20%)			
Criterion 1: Data Collection and Processing	**5**		
Criterion 2: Solution Validation	**15**		
Chapter 7: Report and Presentation (5%)			
Criterion 1: Report	**2**		
Criterion 2: Presentation	**3**		
TOTAL SCORE	**100**		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	**Description**
5	**Demonstrates complete understanding of the problem. All requirements of task are included in response**
4	**Demonstrates considerable understanding of the problem. All requirements of task are included.**
3	**Demonstrates partial understanding of the problem. Most requirements of task are included.**
2	**Demonstrates little understanding of the problem. Many requirements of task are missing.**
1	**Demonstrates no understanding of the problem.**
0	**No response/task not attempted**

Note: this rubric is also used to evaluate questions in an exam.

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 04/04/2024

Ho Chi Minh City, 26/04/2024

Dean of School of Industrial Engineering and Management

(Signature)

Assoc. Prof. Dr. Nguyen Van Hop

ĐẠI HỌC QUỐC GIA
THÀNH PHỐ HỒ CHÍ MINH
TRƯỜNG ĐẠI HỌC QUỐC TẾ

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

PHỤ LỤC 3:

BẢNG MÔ TẢ SỐ TÍN CHỈ THỰC TẬP CỦA CTĐT ĐƯỢC THỂ HIỆN CỤ THỂ THEO MÔN HỌC ĐỂ ĐẢM BẢO 8TC THỰC TẬP THEO QUY ĐỊNH TẠI THÔNG TƯ 17/2021/TT-BGDĐT

(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2025 của Hiệu trưởng trường Đại học Quốc tế)

Mã môn học	Tên môn học Tiếng việt	Tên môn học Tiếng Anh	Loại môn học	Số tín chỉ
IS052IU	Thực tập 1	Internship 1	Bắt buộc	2
IS053IU	Thực tập 2	Internship 2	Bắt buộc	3
IS083IU	Đồ án	Capstone design	Bắt buộc	3
Tổng số tín chỉ				8

ĐẠI HỌC QUỐC GIA
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CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

Phụ lục 4

MỨC ĐỘ ĐÁP ỨNG KHUNG NĂNG LỰC SỐ CỦA CHƯƠNG TRÌNH ĐÀO TẠO

(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2025 của Hiệu trưởng Trường Đại học Quốc tế)

** Đáp ứng Thông tư 02/2025/TT-BGDĐT ngày 24/01/2025 của Bộ Giáo dục và Đào tạo Quy định về Khung năng lực số cho người học.*

I. Mức độ đáp ứng khung năng lực số của chương trình đào tạo

1. Miền năng lực 1: Khai thác dữ liệu và thông tin

** Đánh giá năng lực thành phần theo 8 bậc của Khung năng lực số (từ bậc 1 đến bậc 8)*

STT	Mã MH	Tên MH	NLTP 1.1	NLTP 1.2	NLTP 1.3
1	IS115IU	Introduction to Computing	5	5	5
2	IS085IU	CAD/CAM/ CNC	5	5	5
3	IS001IU	Introduction to Industrial Engineering	5	5	5
4	IS103IU	Deterministic Models in OR	5	5	5
5	IS028IU	Simulation Models in Industrial Engineering	5	5	5
6	IS027IU	Scheduling & Sequencing	5	5	5
7	IS023IU	Inventory Management	5	5	5
8	IS091IU	Management Information Systems with ERP Applications	6	6	6
9	IS026IU	Project Management	5	5	5
10	IS058IU	Time Series & Forecasting Techniques	6	6	6
11	IS031IU	Experimental Design	6	6	6
12	IS033IU	Multi-Criteria Decision Making	5	5	5
13	IS096IU	Advanced Industrial Big Data Analytics	7	7	7
14	IS092IU	Data Collection, Analysis and Applications	7	7	7
15	IS113IU	Engineering Computing Skills	7	7	7
16	IS095IU	Industrial Intelligent Systems	7	7	7
17	IS099IU	Industrial & Commercial Data Systems	5	4	4
18	IS106IU	E-commerce Systems	6	6	6
19	IS093IU	Predictive Data Analytics and Applications	7	7	7

20	IS097IU	Smart Manufacturing Systems	5	5	5
21	IS100IU	Decision Analytics	6	6	7
22	IS035IU	Systems Engineering	6	6	6
23	IS062IU	E-Logistics in Supply Chain Management	6	6	6
24	IS043IU	Flexible Manufacturing Systems	5	5	5
25	IS098IU	Advanced Modeling & Prototyping	5	5	5
26	IS101IU	Industrial Process, System Data Analysis and Modelling	6	6	6
27	IS066IU	Data Mining In Supply Chain	7	7	7
28	IS083IU	Capstone Design	7	7	8
29	IS071IU	Thesis	8	8	8

2. Miền năng lực 2: Giao tiếp và hợp tác trong môi trường số

** Đánh giá năng lực thành phần theo 8 bậc của Khung năng lực số (từ bậc 1 đến bậc 8)*

STT	Mã MH	Tên MH	NLTP 2.1	NLTP 2.2	NLTP 2.3	NLTP 2.4	NLTP 2.5	NLTP 2.6
1	IS115IU	Introduction to Computing	5	5	5	5	5	5
2	IS085IU	CAD/CAM/ CNC	4	4	4	5	5	5
3	IS001IU	Introduction to Industrial Engineering	5	5	5	5	5	5
4	IS103IU	Deterministic Models in OR	5	5	5	5	5	5
5	IS028IU	Simulation Models in Industrial Engineering	5	5	5	5	5	5
6	IS027IU	Scheduling & Sequencing	5	5	5	5	5	5
7	IS023IU	Inventory Management	5	5	5	5	5	5
8	IS091IU	Management Information Systems with ERP Applications	6	6	6	7	7	7
9	IS026IU	Project Management	5	5	5	5	5	5
10	IS058IU	Time Series & Forecasting Techniques	6	6	6	5	5	5
11	IS031IU	Experimental Design	6	6	6	5	6	6
12	IS033IU	Multi-Criteria Decision Making	5	5	5	6	6	6
13	IS096IU	Advanced Industrial Big Data Analytics	7	7	7	7	7	7
14	IS092IU	Data Collection, Analysis and Applications	7	7	7	6	6	6
15	IS113IU	Engineering Computing Skills	7	7	7	5	5	5

16	IS095IU	Industrial Intelligent Systems	7	7	7	6	6	6
17	IS099IU	Industrial & Commercial Data Systems	5	4	4	6	6	6
18	IS106IU	E-commerce Systems	6	6	6	6	6	6
19	IS093IU	Predictive Data Analytics and Applications	7	7	7	5	5	5
20	IS097IU	Smart Manufacturing Systems	4	4	4	5	5	5
21	IS100IU	Decision Analytics	6	6	7	6	6	6
22	IS035IU	Systems Engineering	6	6	6	5	5	5
23	IS062IU	E-Logistics in Supply Chain Management	6	6	6	5	5	5
24	IS043IU	Flexible Manufacturing Systems	4	4	4	5	5	5
25	IS098IU	Advanced Modeling & Prototyping	5	5	5	5	5	5
26	IS101IU	Industrial Process, System Data Analysis and Modelling	6	6	6	6	6	6
27	IS066IU	Data Mining In Supply Chain	7	7	7	6	6	6
28	IS083IU	Capstone Design	7	7	8	8	8	8
29	IS071IU	Thesis	8	8	8	8	8	8

3. Miền năng lực 3: Sáng tạo nội dung số

** Đánh giá năng lực thành phần theo 8 bậc của Khung năng lực số (từ bậc 1 đến bậc 8)*

STT	Mã MH	Tên MH	NLTP 3.1	NLTP 3.2	NLTP 3.3	NLTP 3.4
1	IS115IU	Introduction to Computing	5	5	5	6
2	IS085IU	CAD/CAM/ CNC	5	5	5	6
3	IS001IU	Introduction to Industrial Engineering	5	5	5	6
4	IS103IU	Deterministic Models in OR	5	5	5	6
5	IS028IU	Simulation Models in Industrial Engineering	5	5	5	6
6	IS027IU	Scheduling & Sequencing	5	5	5	6
7	IS023IU	Inventory Management	5	5	5	6
8	IS091IU	Management Information Systems with ERP Applications	5	5	5	6
9	IS026IU	Project Management	5	5	5	6
10	IS058IU	Time Series & Forecasting Techniques	6	6	6	6
11	IS031IU	Experimental Design	6	6	6	6
12	IS033IU	Multi-Criteria Decision Making	4	4	4	4

13	IS096IU	Advanced Industrial Big Data Analytics	6	6	6	6
14	IS092IU	Data Collection, Analysis and Applications	6	6	6	6
15	IS113IU	Engineering Computing Skills	6	6	6	6
16	IS095IU	Industrial Intelligent Systems	6	6	6	6
17	IS099IU	Industrial & Commercial Data Systems	6	6	6	6
18	IS106IU	E-commerce Systems	6	6	6	6
19	IS093IU	Predictive Data Analytics and Applications	6	6	6	6
20	IS097IU	Smart Manufacturing Systems	5	5	5	6
21	IS100IU	Decision Analytics	6	6	6	6
22	IS035IU	Systems Engineering	6	6	6	6
23	IS062IU	E-Logistics in Supply Chain Management	6	6	6	6
24	IS043IU	Flexible Manufacturing Systems	5	5	5	6
25	IS098IU	Advanced Modeling & Prototyping	5	5	5	6
26	IS101IU	Industrial Process, System Data Analysis and Modelling	6	6	6	6
27	IS066IU	Data Mining In Supply Chain	6	6	6	6
28	IS083IU	Capstone Design	6	6	6	6
29	IS071IU	Thesis	6	6	6	6

4. Miền năng lực 4: An toàn

** Đánh giá năng lực thành phần theo 8 bậc của Khung năng lực số (từ bậc 1 đến bậc 8)*

STT	Mã MH	Tên MH	NLTP 4.1	NLTP 4.2	NLTP 4.3	NLTP 4.4
1	IS115IU	Introduction to Computing	2	2	3	3
2	IS085IU	CAD/CAM/ CNC	2	2	3	3
3	IS001IU	Introduction to Industrial Engineering	2	2	3	3
4	IS103IU	Deterministic Models in OR	2	2	3	3
5	IS028IU	Simulation Models in Industrial Engineering	2	2	3	3
6	IS027IU	Scheduling & Sequencing	2	2	3	3
7	IS023IU	Inventory Management	2	2	3	3
8	IS091IU	Management Information Systems with ERP Applications	2	2	3	3
9	IS026IU	Project Management	2	2	3	3
10	IS058IU	Time Series & Forecasting Techniques	2	2	3	3
11	IS031IU	Experimental Design	2	2	3	3

12	IS033IU	Multi-Criteria Decision Making	2	2	3	3
13	IS096IU	Advanced Industrial Big Data Analytics	2	2	3	3
14	IS092IU	Data Collection, Analysis and Applications	2	2	3	3
15	IS113IU	Engineering Computing Skills	2	2	3	3
16	IS095IU	Industrial Intelligent Systems	2	2	3	3
17	IS099IU	Industrial & Commercial Data Systems	2	2	3	3
18	IS106IU	E-commerce Systems	2	2	3	3
19	IS093IU	Predictive Data Analytics and Applications	2	2	3	3
20	IS097IU	Smart Manufacturing Systems	2	2	3	3
21	IS100IU	Decision Analytics	2	2	3	3
22	IS035IU	Systems Engineering	2	2	3	3
23	IS062IU	E-Logistics in Supply Chain Management	2	2	3	3
24	IS043IU	Flexible Manufacturing Systems	2	2	3	3
25	IS098IU	Advanced Modeling & Prototyping	2	2	3	3
26	IS101IU	Industrial Process, System Data Analysis and Modelling	2	2	3	3
27	IS066IU	Data Mining In Supply Chain	2	2	3	3
28	IS083IU	Capstone Design	2	2	3	3
29	IS071IU	Thesis	2	2	3	3

5. Miền năng lực 5: Giải quyết vấn đề

** Đánh giá năng lực thành phần theo 8 bậc của Khung năng lực số (từ bậc 1 đến bậc 8)*

STT	Mã MH	Tên MH	NLTP 5.1	NLTP 5.2	NLTP 5.3	NLTP 5.4
1	IS115IU	Introduction to Computing	6	6	6	3
2	IS085IU	CAD/CAM/ CNC	5	5	5	3
3	IS001IU	Introduction to Industrial Engineering	6	6	6	3
4	IS103IU	Deterministic Models in OR	6	6	6	3
5	IS028IU	Simulation Models in Industrial Engineering	5	5	5	3
6	IS027IU	Scheduling & Sequencing	6	6	6	3
7	IS023IU	Inventory Management	6	6	6	3
8	IS091IU	Management Information Systems with ERP Applications	7	7	7	3
9	IS026IU	Project Management	6	6	6	3
10	IS058IU	Time Series & Forecasting Techniques	6	6	6	3

11	IS031IU	Experimental Design	5	5	5	3
12	IS033IU	Multi-Criteria Decision Making	6	6	6	3
13	IS096IU	Advanced Industrial Big Data Analytics	7	7	7	3
14	IS092IU	Data Collection, Analysis and Applications	7	7	7	3
15	IS113IU	Engineering Computing Skills	6	6	6	3
16	IS095IU	Industrial Intelligent Systems	7	7	7	3
17	IS099IU	Industrial & Commercial Data Systems	7	7	7	3
18	IS106IU	E-commerce Systems	6	6	6	3
19	IS093IU	Predictive Data Analytics and Applications	7	7	7	3
20	IS097IU	Smart Manufacturing Systems	5	5	5	3
21	IS100IU	Decision Analytics	6	6	6	3
22	IS035IU	Systems Engineering	5	5	5	3
23	IS062IU	E-Logistics in Supply Chain Management	6	6	6	3
24	IS043IU	Flexible Manufacturing Systems	5	5	5	3
25	IS098IU	Advanced Modeling & Prototyping	5	5	5	3
26	IS101IU	Industrial Process, System Data Analysis and Modelling	6	6	6	3
27	IS066IU	Data Mining In Supply Chain	6	6	6	3
28	IS083IU	Capstone Design	6	6	6	3
29	IS071IU	Thesis	8	8	8	3

6. Miền năng lực 6: Ứng dụng trí tuệ nhân tạo

** Đánh giá năng lực thành phần theo 8 bậc của Khung năng lực số (từ bậc 1 đến bậc 8)*

STT	Mã MH	Tên MH	NLTP 6.1	NLTP 6.2	NLTP 6.3
1	IS115IU	Introduction to Computing	4	4	3
2	IS085IU	CAD/CAM/ CNC	4	4	3
3	IS001IU	Introduction to Industrial Engineering	4	4	3
4	IS103IU	Deterministic Models in OR	4	4	3
5	IS028IU	Simulation Models in Industrial Engineering	4	4	3
6	IS027IU	Scheduling & Sequencing	4	4	3
7	IS023IU	Inventory Management	4	4	3
8	IS091IU	Management Information Systems with ERP Applications	4	4	3
9	IS026IU	Project Management	4	4	3
10	IS058IU	Time Series & Forecasting Techniques	4	4	3

11	IS031IU	Experimental Design	4	4	3
12	IS033IU	Multi-Criteria Decision Making	4	4	3
13	IS096IU	Advanced Industrial Big Data Analytics	4	4	3
14	IS092IU	Data Collection, Analysis and Applications	4	4	3
15	IS113IU	Engineering Computing Skills	4	4	3
16	IS095IU	Industrial Intelligent Systems	4	4	3
17	IS099IU	Industrial & Commercial Data Systems	4	4	3
18	IS106IU	E-commerce Systems	4	4	3
19	IS093IU	Predictive Data Analytics and Applications	4	4	3
20	IS097IU	Smart Manufacturing Systems	4	4	3
21	IS100IU	Decision Analytics	4	4	3
22	IS035IU	Systems Engineering	4	4	3
23	IS062IU	E-Logistics in Supply Chain Management	4	4	3
24	IS043IU	Flexible Manufacturing Systems	4	4	3
25	IS098IU	Advanced Modeling & Prototyping	4	4	3
26	IS101IU	Industrial Process, System Data Analysis and Modelling	4	4	3
27	IS066IU	Data Mining In Supply Chain	4	4	3
28	IS083IU	Capstone Design	4	4	3
29	IS071IU	Thesis	4	4	3

II. Phương pháp đánh giá chuẩn đầu ra khung năng lực số

1. Miền năng lực 1: Khai thác dữ liệu và thông tin

MMH-TMH	NLTP 1.1	NLTP 1.2	NLTP 1.3
IS115IU-Introduction to Computing	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS085IU-CAD/CAM/ CNC	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS001IU-Introduction to Industrial Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS103IU-Deterministic Models in OR	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS028IU-Simulation Models in Industrial Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS027IU-Scheduling & Sequencing	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS023IU-Inventory Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS091IU-Management Information Systems with ERP Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS026IU-Project Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS058IU-Time Series & Forecasting Techniques	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS031IU-Experimental Design	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS033IU-Multi-Criteria Decision Making	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS096IU-Advanced Industrial Big Data Analytics	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS092IU-Data Collection, Analysis and Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT

IS113IU-Engineering Computing Skills	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS095IU-Industrial Intelligent Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS099IU-Industrial & Commercial Data Systems	FINAL,PROJECT	LAB,MIDTERM	LAB,MIDTERM
IS106IU-E-commerce Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS093IU-Predictive Data Analytics and Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS097IU-Smart Manufacturing Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS100IU-Decision Analytics	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS035IU-Systems Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS062IU-E-Logistics in Supply Chain Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS043IU-Flexible Manufacturing Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS098IU-Advanced Modeling & Prototyping	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS101IU-Industrial Process, System Data Analysis and Modelling	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS066IU-Data Mining In Supply Chain	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS083IU-Capstone Design	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS071IU-Thesis	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT

2. Miền năng lực 2: Giao tiếp và hợp tác trong môi trường số

MMH-TMH	NLTP 2.1	NLTP 2.2	NLTP 2.3	NLTP 2.4	NLTP 2.5	NLTP 2.6
IS115IU-Introduction to Computing	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS085IU-CAD/CAM/CNC	LAB,MIDTERM	LAB,MIDTERM	LAB,MIDTERM	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS001IU-Introduction to Industrial Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS103IU-Deterministic Models in OR	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS028IU-Simulation Models in Industrial Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS027IU-Scheduling & Sequencing	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS023IU-Inventory Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS091IU-Management Information	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT

Systems with ERP Applications						
IS026IU-Project Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS058IU-Time Series & Forecasting Techniques	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS031IU-Experimental Design	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS033IU-Multi-Criteria Decision Making	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS096IU-Advanced Industrial Big Data Analytics	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS092IU-Data Collection, Analysis and Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS113IU-Engineering Computing Skills	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS095IU-Industrial Intelligent Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS099IU-Industrial & Commercial Data Systems	FINAL,PROJECT	LAB,MIDTERM	LAB,MIDTERM	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS106IU-E-commerce Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS093IU-Predictive Data Analytics and Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS097IU-Smart Manufacturing Systems	LAB,MIDTERM	LAB,MIDTERM	LAB,MIDTERM	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT

IS100IU-Decision Analytics	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS035IU-Systems Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS062IU-E-Logistics in Supply Chain Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS043IU-Flexible Manufacturing Systems	LAB,MIDTERM	LAB,MIDTERM	LAB,MIDTERM	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS098IU-Advanced Modeling & Prototyping	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS101IU-Industrial Process, System Data Analysis and Modelling	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS066IU-Data Mining In Supply Chain	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS083IU-Capstone Design	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS071IU-Thesis	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT

3. Miền năng lực 3: Sáng tạo nội dung số

MMH-TMH	**NLTP 3.1**	**NLTP 3.2**	**NLTP 3.3**	**NLTP 3.4**
IS115IU-Introduction to Computing	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS085IU-CAD/CAM/ CNC	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS001IU-Introduction to Industrial Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS103IU-Deterministic Models in OR	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS028IU-Simulation Models in Industrial Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS027IU-Scheduling & Sequencing	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS023IU-Inventory Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS091IU-Management Information Systems with ERP Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS026IU-Project Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT

IS058IU-Time Series & Forecasting Techniques	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS031IU-Experimental Design	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS033IU-Multi-Criteria Decision Making	LAB,MIDTERM	LAB,MIDTERM	LAB,MIDTERM	LAB,MIDTERM
IS096IU-Advanced Industrial Big Data Analytics	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS092IU-Data Collection, Analysis and Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS113IU-Engineering Computing Skills	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS095IU-Industrial Intelligent Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS099IU-Industrial & Commercial Data Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS106IU-E-commerce Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS093IU-Predictive Data Analytics and Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS097IU-Smart Manufacturing Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS100IU-Decision Analytics	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS035IU-Systems Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS062IU-E-Logistics in Supply Chain Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS043IU-Flexible Manufacturing Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS098IU-Advanced Modeling & Prototyping	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS101IU-Industrial Process, System Data Analysis and Modelling	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS066IU-Data Mining In Supply Chain	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS083IU-Capstone Design	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT
IS071IU-Thesis	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT

4. Miền năng lực 4: An toàn

MMH-MH	NLTP 4.1	NLTP 4.2	NLTP 4.3	NLTP 4.4
IS115IU-Introduction to Computing	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS085IU-CAD/CAM/ CNC	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS001IU-Introduction to Industrial Engineering	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS103IU-Deterministic Models in OR	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS028IU-Simulation Models in Industrial Engineering	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS027IU-Scheduling & Sequencing	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS023IU-Inventory Management	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS091IU-Management Information Systems with ERP Applications	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK

IS026IU-Project Management	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS058IU-Time Series & Forecasting Techniques	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS031IU-Experimental Design	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS033IU-Multi-Criteria Decision Making	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS096IU-Advanced Industrial Big Data Analytics	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS092IU-Data Collection, Analysis and Applications	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS113IU-Engineering Computing Skills	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS095IU-Industrial Intelligent Systems	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS099IU-Industrial & Commercial Data Systems	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS106IU-E-commerce Systems	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS093IU-Predictive Data Analytics and Applications	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS097IU-Smart Manufacturing Systems	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS100IU-Decision Analytics	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS035IU-Systems Engineering	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS062IU-E-Logistics in Supply Chain Management	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS043IU-Flexible Manufacturing Systems	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS098IU-Advanced Modeling & Prototyping	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS101IU-Industrial Process, System Data Analysis and Modelling	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS066IU-Data Mining In Supply Chain	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS083IU-Capstone Design	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK
IS071IU-Thesis	HOMEWORK	HOMEWORK	HOMEWORK	HOMEWORK

5. Miền năng lực 5: Giải quyết vấn đề

MMH-TMH	NLTP 5.1	NLTP 5.2	NLTP 5.3	NLTP 5.4
IS115IU-Introduction to Computing	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS085IU-CAD/CAM/ CNC	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS001IU-Introduction to Industrial Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS103IU-Deterministic Models in OR	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS028IU-Simulation Models in Industrial Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS027IU-Scheduling & Sequencing	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS023IU-Inventory Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS091IU-Management Information Systems with ERP Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS026IU-Project Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS058IU-Time Series & Forecasting Techniques	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS031IU-Experimental Design	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS033IU-Multi-Criteria Decision Making	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK

IS096IU-Advanced Industrial Big Data Analytics	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS092IU-Data Collection, Analysis and Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS113IU-Engineering Computing Skills	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS095IU-Industrial Intelligent Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS099IU-Industrial & Commercial Data Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS106IU-E-commerce Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS093IU-Predictive Data Analytics and Applications	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS097IU-Smart Manufacturing Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS100IU-Decision Analytics	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS035IU-Systems Engineering	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS062IU-E-Logistics in Supply Chain Management	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS043IU-Flexible Manufacturing Systems	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS098IU-Advanced Modeling & Prototyping	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS101IU-Industrial Process, System Data Analysis and Modelling	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS066IU-Data Mining In Supply Chain	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS083IU-Capstone Design	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK
IS071IU-Thesis	FINAL,PROJECT	FINAL,PROJECT	FINAL,PROJECT	HOMEWORK

6. Miền năng lực 6: Ứng dụng trí tuệ nhân tạo

MMH-TMH	NLTP 6.1	NLTP 6.2	NLTP 6.3
IS115IU-Introduction to Computing	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS085IU-CAD/CAM/ CNC	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS001IU-Introduction to Industrial Engineering	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS103IU-Deterministic Models in OR	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS028IU-Simulation Models in Industrial Engineering	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS027IU-Scheduling & Sequencing	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS023IU-Inventory Management	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS091IU-Management Information Systems with ERP Applications	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS026IU-Project Management	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS058IU-Time Series & Forecasting Techniques	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS031IU-Experimental Design	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS033IU-Multi-Criteria Decision Making	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS096IU-Advanced Industrial Big Data Analytics	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS092IU-Data Collection, Analysis and Applications	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS113IU-Engineering Computing Skills	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS095IU-Industrial Intelligent Systems	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK

IS099IU-Industrial & Commercial Data Systems	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS106IU-E-commerce Systems	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS093IU-Predictive Data Analytics and Applications	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS097IU-Smart Manufacturing Systems	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS100IU-Decision Analytics	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS035IU-Systems Engineering	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS062IU-E-Logistics in Supply Chain Management	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS043IU-Flexible Manufacturing Systems	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS098IU-Advanced Modeling & Prototyping	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS101IU-Industrial Process, System Data Analysis and Modelling	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS066IU-Data Mining In Supply Chain	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS083IU-Capstone Design	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK
IS071IU-Thesis	LAB,MIDTERM	LAB,MIDTERM	HOMEWORK