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 KHÓA 2024 - NGÀNH KHOA HỌC DỮ LIỆU
TRÌNH ĐỘ ĐẠI HỌC

(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2024
của Hiệu trưởng Trường Đại học Quốc tế)

1. Thông tin chung

- Tên ngành đào tạo:
+ Tiếng Việt: Khoa học Dữ liệu
+ Tiếng Anh: Data Science
- Mã ngành đào tạo: 7460108
- Trình độ đào tạo: Cử nhận
- Loại hình đào tạo: Tập trung
- Thời gian đào tạo: 4 năm (8 học kỳ)
- Tên văn bằng sau khi tốt nghiệp:
+ Tiếng Việt: Cử nhân Khoa học Dữ liệu
+ Tiếng Anh: Bachelor of Science in Data Science
- Nơi đào tạo: trường đại học Quốc Tế - Đại học Quốc Gia thành phố Hồ Chí Minh

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 Đề án tuyển sinh hàng năm của Đại học Quốc gia TP.HCM và Đề án 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 Đề án tuyển sinh hàng năm của Đại học Quốc gia TP.HCM và Đề án tuyển sinh của trường Đại học Quốc tế.

c. Tổ hợp môn xét tuyển: A00 (Toán -Lý-Hoá), A01 (Toán-Lý-Anh)

d. Dự kiến chỉ tiêu tuyển sinh, quy mô đào tạo: 50-100 sinh viên cho mỗi khoá

3. Mục tiêu đào tạo

a. Mục tiêu chung:

Bảng 1. Sự phù hợp của mục tiêu đào tạo với Tầm nhìn, sứ mạng và Mục tiêu giáo dục của Luật giáo dục đại học

Mục tiêu đào tạo của CTĐT	Tầm nhìn	Sứ mạng (tô đậm những nội hàm mà mục tiêu thể hiện hoặc gắn kết)	Luật giáo dục (tô đậm những nội hàm mà mục tiêu thể hiện hoặc gắn kết)
Ngành KHDL tại Khoa CNTT đào tạo ra các cử nhân đạt được: (i) nền tảng kiến thức cơ bản vững chắc về quản lý, xử lý và phân tích dữ liệu lớn, (ii) kiến thức chuyên ngành sâu và rộng về khoa học dữ liệu và hệ thống thông tin, (iii) kiến thức về hội nhập, khởi nghiệp, (iv) các kỹ năng mềm cần thiết, (v) đạo đức nghề nghiệp và ý thức trách nhiệm đối với bản thân và xã hội, (vi) khả năng tự học hoặc tham gia các khóa bồi dưỡng để nắm bắt các công nghệ mới, và (vii) đủ năng lực học tiếp sau đại học trong và ngoài nước.	Khoa CNTT là một trong các khoa của Trường Đại học Quốc tế, ĐHQG-TP.HCM. Do đó, tầm nhìn của Khoa phụ thuộc và tầm nhìn của Trường (**Trường ĐHQT là trường đại học nghiên cứu thuộc tốp đầu tại châu Á; là cơ sở giáo dục 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**.)	**Đào tạo chất lượng cao đa ngành – đa lĩnh vực cho bậc đại học và sau đại học. Tất cả các CTĐT được đánh giá theo tiêu chuẩn trong nước và quốc tế AUN.** **Nâng cao nghiên cứu cơ bản và nghiên cứu ứng dụng để đáp ứng được nhu cầu của doanh nghiệp, địa phương, xã hội và tiêu chuẩn quốc tế.** Đảm nhận vai trò tiên phong tại Việt Nam bằng cách thực hành quản lý xuất sắc, truyền cảm hứng và hỗ trợ các thành viên của ĐHQG TP.HCM trong việc phát triển toàn diện	**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 (Điều 2)

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, 1 mục tiêu về kỹ năng và 2 mục tiêu về tự chủ và trách nhiệm, được trình bày như sau:

Kiến thức:

(PO1): Có kiến thức cơ bản và nâng cao về lĩnh vực Khoa học dữ liệu

Kỹ năng:

(PO2): Có kỹ năng làm việc vững chắc và tư duy hệ thống để giải quyết các vấn đề thực tế

Tự chủ và trách nhiệm

(PO3): Làm việc hiệu quả, có đạo đức và sáng tạo như một chuyên gia dữ liệu

(PO4): Có khả năng tiếp tục học hỏi suốt đời và phát triển chuyên môn

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. Với mỗi nhóm mục tiêu kiến thức, kỹ năng, mức tự chủ và trách nhiệm cần xác định các chuẩn đầu ra tương ứng. 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)

Bảng 2. Chuẩn đầu ra của CTĐT theo thang do Bloom

Chuẩn đầu ra (CĐR)	Nội dung Chuẩn đầu ra (PLOs)	Trình độ năng lực*
Kiến thức		
1.1	PLO1. Phân tích một vấn đề máy tính phức tạp và áp dụng các nguyên lý của máy tính và các lĩnh vực liên quan khác để xác định các giải pháp	4.0
1.2	PLO6: Áp dụng lý thuyết khoa học dữ liệu và các nguyên tắc cơ bản của phát triển phần mềm để tạo ra các giải pháp dựa trên máy tính, thông tin học	5.0
Kỹ năng		
2.1	PLO2. Thiết kế, triển khai và đánh giá một giải pháp dựa trên máy tính để đáp ứng một tập hợp yêu cầu máy tính cụ thể trong bối cảnh của ngành học.	5.0
2.2	PLO5: Hoạt động hiệu quả như một thành viên hoặc lãnh đạo của một nhóm tham gia các hoạt động phù hợp với ngành học của chương trình	5.0
Mức tự chủ và trách nhiệm		
3.1	PLO3: Giao tiếp hiệu quả trong nhiều ngữ cảnh chuyên nghiệp khác nhau	5.0

3.2	PLO4: Nhận biết trách nhiệm chuyên nghiệp và đưa ra nhận định có hiểu biết trong thực hành máy tính dựa trên nguyên tắc pháp lý và đạo đức	4.5

*Trình độ năng lực theo thang Bloom

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

Bảng 3. Mối quan hệ giữa CĐR của CTĐT và mục tiêu đào tạo

	PLOs(1)	**POs(2)**			
		PO1	**PO2**	**PO3**	**PO4**
Kiến thức	PLO1	x			
	PLO6				x
Kỹ năng	PLO2		x		
	PLO5			x	
Tự chủ và trách nhiệm	PLO3			x	
	PLO4			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 4: Thang điểm

Xếp loại	Thang điểm 100	Điểm chữ	Thang điểm 4
Xuất sắc	Từ 90 đến 100	A+	4,0
Giỏi	Từ 80 đến cận 90	A	3,5
Khá	Từ 70 đến cận 80	B+	3,0
Trung bình khá	Từ 60 đến cận 70	B	2,5
Trung bình	Từ 50 đến cận 60	C	2,0
Yếu	Từ 40 đến cận 50	D+	1,5
Kém	Từ 30 đến cận 40	D	1,0
	Dưới 30	F	0,0

8. Khối lượng kiến thức toàn khoá

Tổng số tín chỉ: 129 tín chỉ, trong đó phân bổ kiến thức như Bảng 5 (không bao gồm giáo dục thể chất và giáo dục quốc phòng):

Bảng 5. Cấu trúc chương trình đào tạo

TT	Các khối kiến thức(3)	Khối lượng	
		Số tín chỉ	%
I	Khối kiến thức giáo dục đại cương	39	30,23
II	Khối kiến thức cơ sở ngành	27	20,93
III	Kiến thức chuyên ngành	47	36,44
IV	Kiến thức bổ trợ	0	0
V	Thực tập, khóa luận/luận văn tốt nghiệp	16	12,4
	Tổng cộng	**129**	**100**

9. Nội dung chương trình đào tạo

Bảng 6. Các môn học thuộc CTĐT

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**							
1.1	Lý luận chính trị							
1	PE015IU	Triết học Mác-Lênin	Philosophy Marx – Lenin	Bắt buộc	3	3	0	
2	PE016IU	Kinh tế chính trị Mác-Lênin	Marx-Lenin Political Economy	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	
1.2	Khoa học xã hội - Nhân văn - Nghệ thuật							
6	PE021IU	Pháp luật đại cương	General law	Bắt buộc	3	3	0	
7	MA001IU	Toán 1	Calculus 1	Bắt buộc	4	4	0	
8	IT154IU	Đại số tuyến tính	Linear Algebra	Bắt buộc	3	3	0	
9	MA026IU	Xác suất, thống kê và quy trình ngẫu nhiên	Probability, Statistic & Random Process	Bắt buộc	3	3	0	

10	IT151IU	Phương pháp thống kê	Statistical Method	Bắt buộc	3	3	0	
11	IT171IU	Thống kê nâng cao	Statistical Learning	Bắt buộc	4	3	1	Phòng TN.CNTT
1.3	Ngoại ngữ							
12	EN008IU	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Academic English 1 (listening skill)	Bắt buộc	2	2	0	
13	EN007IU	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Academic English 1 (writing skill)	Bắt buộc	2	2	0	
14	EN012IU	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Academic English 2 (speaking skill)	Bắt buộc	2	2	0	
15	EN011IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Academic English 2 (writing skill)	Bắt buộc	2	2	0	
1.4	Giáo dục thể chất							
16	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3	0	3	
17	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3	0	3	
1.5	Giáo dục quốc phòng							
II	**Kiến thức cơ sở ngành**							
18	IT135IU	Nhập môn khoa học dữ liệu	Introduction to Data Science	Bắt buộc	3	3	0	
19	IT149IU	Lập trình cơ bản	Fundamentals of Programming	Bắt buộc	4	3	1	Phòng TN.CNTT

20	IT069IU	Lập trình hướng đối tượng	Object-Oriented Programming	Bắt buộc	4	3	1	Phòng TN.CNTT
21	IT013IU	Cấu trúc dữ liệu và giải thuật	Data Structures and Algorithms	Bắt buộc	4	3	1	Phòng TN.CNTT
22	IT079IU	Nguyên tắc của quản trị cơ sở dữ liệu	Principles of Database Management	Bắt buộc	4	3	1	Phòng TN.CNTT
23	IT159IU	Trí tuệ nhân tạo	Artificial Intelligence	Bắt buộc	4	3	1	Phòng TN.CNTT
24	IT140IU	Khái niệm cơ bản về bảo mật dữ liệu	Fundamental Concepts of Data Security	Bắt buộc	4	3	1	Phòng TN.CNTT
III	**Kiến thức chuyên ngành**							
25	IT137IU	Phân tích dữ liệu	Data Analysis	Bắt buộc	4	3	1	Phòng TN.CNTT
26	IT136IU	Phân tích hồi qui	Regression Analysis	Bắt buộc	4	3	1	Phòng TN.CNTT
27	IT138IU	Khoa học dữ liệu và trực quan hóa dữ liệu	Data Science and Data Visualization	Bắt buộc	4	3	1	Phòng TN.CNTT
28	IT139IU	Tính toán khả năng mở rộng và phân bố	Scalable and Distributed Computing	Bắt buộc	4	3	1	Phòng TN.CNTT
29	IT160IU	Khai thác dữ liệu	Data Mining	Bắt buộc	4	3	1	Phòng TN.CNTT

30	IT157IU	Học sâu	Deep Learning	Bắt buộc	4	3	1	Phòng TN.CNTT
31	IT172IU	Học máy	Machine Learning	Bắt buộc	4	3	1	Phòng TN.CNTT
32	IT173IU	Phân tích dữ liệu lớn	Big Data Analytics	Bắt buộc	4	3	1	Phòng TN.CNTT
	Kiến thức tự chọn (SV chọn 15 tín chỉ trong danh sách sau)							
33	IT169IU	Phân tích chuỗi thời gian	Time Series Analysis	Tự chọn	4	3	1	Phòng TN.CNTT
34	IT150IU	Blockchain	Blockchain	Tự chọn	4	3	1	Phòng TN.CNTT
35	IT076IU	Công nghệ phần mềm	Software Engineering	Tự chọn	4	3	1	Phòng TN.CNTT
36	IT170IU	Xử lý ngôn ngữ tự nhiên	Natural Language Processing	Tự chọn	4	3	1	Phòng TN.CNTT
37	IT044IU	Thiết kế giao diện và trải nghiệm người dùng	Human-Computer Interaction	Tự chọn	4	3	1	Phòng TN.CNTT
38	IT093IU	Phát triển ứng dụng web	Web Application Development	Tự chọn	4	3	1	Phòng TN.CNTT
39	IT144IU	Phân Tích Quy Trình Nghiệp Vụ	Business Process Analysis	Tự chọn	4	3	1	Phòng TN.CNTT
40	IT145IU	Hệ Thống Hỗ Trợ Quyết Định	Decision Support Systems	Tự chọn	4	3	1	Phòng TN.CNTT

41	IT146IU	Lý Thuyết Mạng Máy Tính	Theory of Networks	Tự chọn	4	3	1	Phòng TN.CNTT
42	IT056IU	Quản Trị Dự Án CNTT	IT Project Management	Tự chọn	4	3	1	Phòng TN.CNTT
43	IT094IU	Quản Lý Hệ Thống Thông Tin	Information System Management	Tự chọn	3	3	0	
44	IT164IU	Điện Toán Đám Mây	Cloud Computing	Tự chọn	4	3	1	Phòng TN.CNTT
45	IT120IU	Khởi nghiệp	Entrepreneur ship	Tự chọn	3	3	0	
46	IT163IU	Tối ưu hóa và ứng dụng	Optimization and Applications	Tự chọn	4	3	1	
47	IT153IU	Toán rời rạc	Discrete Mathematics	Tự chọn	3	3	0	
48		Tự chọn tự do	Free elective	Tự chọn	4	3 or 4	1 or 0	
IV	**Thực tập, khóa luận/luận văn tốt nghiệp**							
49	IT082IU	Thực tập công nghiệp	Internship	Bắt buộc	3	3	0	
50	IT083IU	Thực tập tốt nghiệp	Special Study of the Field	Bắt buộc	3	3	0	
51	IT058IU	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	10	0	
	Tổng số (tín chỉ)				129	(Không tính GDTC)		

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

Tùy vào trình độ tiếng Anh của người học đạt trình độ AE1, IE2, IE1 và IE0, kế hoạch giảng dạy các môn học được cụ thể tương ứng được trình bày trong các Bảng 7-10.

10.1 Trình độ AE1

Bảng 7: Kế hoạch giảng dạy đối với người học đạt trình độ AE1

Học kỳ	Mã MH	Tên MH		Loại MH (bắt buộc/ tự chọn)	Tín chỉ			Môn học tiên quyết (TQ)/ học trước (HT)/ song hành (SH)
		Tiếng Anh	Tiếng Việt		Tổng cộng	Lý thuyết	Thực hành/ Thí nghiệm	
I (15 tín chỉ)	MA001IU	Calculus 1	Toán 1	Bắt buộc	4	4	0	
	EN008IU	Academic English 1 (listening skill)	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Bắt buộc	2	2	0	
	EN007IU	Academic English 1 (writing skill)	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Bắt buộc	2	2	0	
	IT135IU	Introduction to Data Science	Nhập môn khoa học dữ liệu	Bắt buộc	3	3	0	
	IT149IU	Fundamentals of Programming	Lập trình cơ bản	Bắt buộc	4	3	1	
Tổng cộng					15	14	1	
II (17 tín chỉ)	MA026IU	Probability, Statistic & Random Process	Xác suất, thống kê và quy trình ngẫu nhiên	Bắt buộc	3	3	0	HT: MA001IU
	IT154IU	Linear Algebra	Đại số tuyến tính	Bắt buộc	3	3	0	HT: MA001IU, IT149IU
	EN012IU	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Bắt buộc	2	2	0	

	EN011IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Bắt buộc	2	2	0	HT: EN007IU
	PE015IU	Philosophy Marx – Lenin	Triết học Mác-Lênin	Bắt buộc	3	3	0	
	IT069IU	Object-Oriented Programming	Lập trình hướng đối tượng	Bắt buộc	4	3	1	TQ: IT149IU
Tổng cộng					17	16	1	
III (17 tín chỉ)	PE016IU	Marx-Lenin Political Economy	Kinh tế chính trị Mác-Lênin	Bắt buộc	2	2	0	
	IT151IU	Statistical Method	Phương pháp thống kê	Bắt buộc	3	3	0	HT: MA001IU, IT149IU
	IT013IU	Data Structures and Algorithms	Cấu trúc dữ liệu và giải thuật	Bắt buộc	4	3	1	HT: IT069IU
	IT097IU	Principles of Database Management	Nguyên tắc của quản trị cơ sở dữ liệu	Bắt buộc	4	3	1	HT: IT149IU
	IT140IU	Khái niệm cơ bản về bảo mật dữ liệu	Khái niệm cơ bản về bảo mật dữ liệu	Bắt buộc	4	3	1	
Tổng cộng					17	14	3	
IV (20 tín chỉ)	PE017IU	Scientific Socialism	Chủ nghĩa xã hội khoa học	Bắt buộc	2	2	0	HT: PE015IU, PE016IU
	PE021IU	General law	Pháp luật đại cương	Bắt buộc	3	3	0	
	IT159IU	Artificial Intelligence	Trí tuệ nhân tạo	Bắt buộc	4	3	1	HT: IT013IU, MA026IU
	IT171IU	Statistical Learning	Thống kê nâng cao	Bắt buộc	4	3	1	HT: IT151IU
	IT136IU	Regression Analysis	Phân tích hồi qui	Bắt buộc	4	3	1	HT: IT013IU

	PT001IU	Physical Training 1	Giáo dục thể chất 1	Bắt buộc	3	0	3	
Tổng cộng					20	14	6	
V (18 tín chỉ	PE018IU	History of Vietnamese Communist Party	Lịch sử Đảng cộng sản Việt Nam	Bắt buộc	2	2	0	HT: PE017IU
	IT138IU	Data Science and Data Visualization	Khoa học dữ liệu và trực quan hóa dữ liệu	Bắt buộc	4	3	1	
	IT160IU	Data Mining	Khai thác dữ liệu	Bắt buộc	4	3	1	HT: IT159IU
	IT139IU	Scalable and Distributed Computing	Tính toán khả năng mở rộng và phân bố	Bắt buộc	4	3	1	HT: IT013IU
	IT137IU	Data Analysis	Phân tích dữ liệu	Bắt buộc	4	3	1	HT: IT151IU
Tổng cộng					18	14	4	
VI (18 tín chỉ)	PE019IU	Ho Chi Minh's Thoughts	Tư tưởng Hồ Chí Minh	Bắt buộc	2	2	0	HT: PE017IU
	IT172IU	Học máy	Học máy	Bắt buộc	4	3	1	HT: IT159IU
	IT157IU	Học sâu	Học sâu	Bắt buộc	4	3	1	HT: IT013IU
				Tự chọn	4	3	1	
				Tự chọn	4	3	1	
Tổng cộng					18	14	4	
VII (17 tín chỉ)	IT083IU	Special Study of the Field	Thực tập tốt nghiệp	Bắt buộc	3	3	0	
	IT173IU	Big Data Analytics	Phân tích dữ liệu lớn	Bắt buộc	4	3	1	
	PT002IU	Physical Training 2	Giáo dục thể chất 2	Bắt buộc	3	0	3	
				Tự chọn	3/4	3	0/1	

				Tự chọn tự do	3/4	3/4	0/1	
Tổng cộng					17	12	5	
Danh sách môn học tự chọn trong CTĐT								
	IT169IU	Phân tích chuỗi thời gian	Time Series Analysis	Tự chọn	4	3	1	HT: IT013IU, IT159IU
	IT150IU	Blockchain	Blockchain	Tự chọn	4	3	1	HT: IT140IU
	IT076IU	Công nghệ phần mềm	Software Engineering	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT170IU	Xử lý ngôn ngữ tự nhiên	Natural Language Processing	Tự chọn	4	3	1	HT: IT069IU, IT079IU, IT137IU
	IT044IU	Thiết kế giao diện và trải nghiệm người dùng	Human-Computer Interaction	Tự chọn	4	3	1	
	IT093IU	Phát triển ứng dụng web	Web Application Development	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT144IU	Phân Tích Quy Trình Nghiệp Vụ	Business Process Analysis	Tự chọn	4	3	1	
	IT145IU	Hệ Thống Hỗ Trợ Quyết Định	Decision Support Systems	Tự chọn	4	3	1	HT: IT069IU
	IT146IU	Lý Thuyết Mạng Máy Tính	Theory of Networks	Tự chọn	4	3	1	
	IT056IU	Quản Trị Dự Án CNTT	IT Project Management	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT094IU	Quản Lý Hệ Thống Thông Tin	Information System Management	Tự chọn	3	3	0	HT: IT079IU
	IT164IU	Điện Toán Đám Mây	Cloud Computing	Tự chọn	4	3	1	HT: IT140IU

	IT120IU	Khởi nghiệp	Entrepreneurs hip	Tự chọn	3	3	0	
	IT163IU	Tối ưu hóa và ứng dụng	Optimization and Applications	Tự chọn	4	3	1	
	IT153IU	Toán rời rạc	Discrete Mathematics	Tự chọn	3	3	0	HT: MA001IU, IT149IU
		Tự chọn tự do	Free elective	Tự chọn	4	3 or 4	1 or 0	
VIII (13 tín chỉ)	IT082IU	Thực tập công nghiệp	Internship	Bắt buộc	3	3	0	
	IT058IU	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	10	0	
Tổng cộng					13	13	0	
	Tổng				135 (Bao gồm GDTC)			

10.2 Trình độ IE2

Bảng 8: Kế hoạch giảng dạy đối với người học đạt trình độ IE2

Học kỳ	**Mã MH**	**Tên MH**		**Loại MH (bắt buộc/ tự chọn)**	**Tín chỉ**			**Môn học tiên quyết (TQ)/ Môn học học trước (HT)/ Môn học song hành (SH)**
		Tiếng Anh	**Tiếng Việt**		**Tổng cộng**	**Lý thuyết**	**Thực hành/ Thí nghiệm**	
I (17 tín chỉ)	ENTP02	Tiếng Anh tăng cường 2	Intensive English 2	bắt buộc	17	17	0	
Tổng cộng					17	17	0	
II (15 tín chỉ)	MA001IU	Calculus 1	Toán 1	Bắt buộc	4	4	0	
	EN008IU	Academic English 1 (listening skill)	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Bắt buộc	2	2	0	

	EN007IU	Academic English 1 (writing skill)	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Bắt buộc	2	2	0	
	IT135IU	Introduction to Data Science	Nhập môn khoa học dữ liệu	Bắt buộc	3	3	0	
	IT149IU	Fundamentals of Programming	Lập trình cơ bản	Bắt buộc	4	3	1	
Tổng cộng					15	14	1	
III (17 tín chỉ)	MA026IU	Probability, Statistic & Random Process	Xác suất, thống kê và quy trình ngẫu nhiên	Bắt buộc	3	3	0	HT: MA001IU
	IT154IU	Linear Algebra	Đại số tuyến tính	Bắt buộc	3	3	0	HT: MA001IU, IT149IU
	EN012IU	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Bắt buộc	2	2	0	
	EN011IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Bắt buộc	2	2	0	HT: EN007IU
	PE015IU	Philosophy Marx – Lenin	Triết học Mác-Lênin	Bắt buộc	3	3	0	
	IT069IU	Object-Oriented Programming	Lập trình hướng đối tượng	Bắt buộc	4	3	1	TQ: IT149IU
Tổng cộng					17	16	1	
VI (17 tín chỉ)	PE016IU	Marx-Lenin Political Economy	Kinh tế chính trị Mác-Lênin	Bắt buộc	2	2	0	
	IT151IU	Statistical Method	Phương pháp thống kê	Bắt buộc	3	3	0	HT: MA001IU, IT149IU
	IT013IU	Data Structures and Algorithms	Cấu trúc dữ liệu và giải thuật	Bắt buộc	4	3	1	HT: IT069IU

	IT097IU	Principles of Database Management	Nguyên tắc của quản trị cơ sở dữ liệu	Bắt buộc	4	3	1	HT: IT149IU
	IT140IU	Khái niệm cơ bản về bảo mật dữ liệu	Khái niệm cơ bản về bảo mật dữ liệu	Bắt buộc	4	3	1	
Tổng cộng					17	14	3	
V (20 tín chỉ)	PE017IU	Scientific Socialism	Chủ nghĩa xã hội khoa học	Bắt buộc	2	2	0	HT: PE015IU, PE016IU
	PE021IU	General law	Pháp luật đại cương	Bắt buộc	3	3	0	
	IT159IU	Artificial Intelligence	Trí tuệ nhân tạo	Bắt buộc	4	3	1	HT: IT013IU, MA026IU
	IT171IU	Statistical Learning	Thống kê nâng cao	Bắt buộc	4	3	1	HT: IT151IU
	IT136IU	Regression Analysis	Phân tích hồi qui	Bắt buộc	4	3	1	HT: IT013IU
	PT001IU	Physical Training 1	Giáo dục thể chất 1	Bắt buộc	3	0	3	
Tổng cộng					20	14	6	
VI (18 tín chỉ	PE018IU	History of Vietnamese Communist Party	Lịch sử Đảng cộng sản Việt Nam	Bắt buộc	2	2	0	HT: PE017IU
	IT138IU	Data Science and Data Visualization	Khoa học dữ liệu và trực quan hóa dữ liệu	Bắt buộc	4	3	1	
	IT160IU	Data Mining	Khai thác dữ liệu	Bắt buộc	4	3	1	HT: IT159IU
	IT139IU	Scalable and Distributed Computing	Tính toán khả năng mở rộng và phân bố	Bắt buộc	4	3	1	HT: IT013IU
	IT137IU	Data Analysis	Phân tích dữ liệu	Bắt buộc	4	3	1	HT: IT151IU
Tổng cộng					18	14	4	

VII (18 tín chỉ)	PE019IU	Ho Chi Minh's Thoughts	Tư tưởng Hồ Chí Minh	Bắt buộc	2	2	0	HT: PE017IU
	IT172IU	Học máy	Học máy	Bắt buộc	4	3	1	HT: IT159IU
	IT157IU	Học sâu	Học sâu	Bắt buộc	4	3	1	HT: IT013IU
				Tự chọn	4	3	1	
				Tự chọn	4	3	1	
Tổng cộng					18	14	4	
VIII (17 tín chỉ)	IT083IU	Special Study of the Field	Thực tập tốt nghiệp	Bắt buộc	3	3	0	
	IT173IU	Big Data Analytics	Phân tích dữ liệu lớn	Bắt buộc	4	3	1	
	PT002IU	Physical Training 2	Giáo dục thể chất 2	Bắt buộc	3	0	3	
				Tự chọn	3/4	3	0/1	
				Tự chọn tự do	3/4	3/4	0/1	
Tổng cộng					17	12	5	
Danh sách môn học tự chọn trong CTĐT								
	IT169IU	Phân tích chuỗi thời gian	Time Series Analysis	Tự chọn	4	3	1	HT: IT013IU, IT159IU
	IT150IU	Blockchain	Blockchain	Tự chọn	4	3	1	HT: IT140IU
	IT076IU	Công nghệ phần mềm	Software Engineering	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT170IU	Xử lý ngôn ngữ tự nhiên	Natural Language Processing	Tự chọn	4	3	1	HT: IT069IU, IT079IU, IT137IU
	IT044IU	Thiết kế giao diện và trải nghiệm người dùng	Human-Computer Interaction	Tự chọn	4	3	1	

	IT093 IU	Phát triển ứng dụng web	Web Application Development	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT144 IU	Phân Tích Quy Trình Nghiệp Vụ	Business Process Analysis	Tự chọn	4	3	1	
	IT145 IU	Hệ Thống Hỗ Trợ Quyết Định	Decision Support Systems	Tự chọn	4	3	1	HT: IT069IU
	IT146 IU	Lý Thuyết Mạng Máy Tính	Theory of Networks	Tự chọn	4	3	1	
	IT056 IU	Quản Trị Dự Án CNTT	IT Project Management	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT094 IU	Quản Lý Hệ Thống Thông Tin	Information System Management	Tự chọn	3	3	0	HT: IT079IU
	IT164 IU	Điện Toán Đám Mây	Cloud Computing	Tự chọn	4	3	1	HT: IT140IU
	IT120 IU	Khởi nghiệp	Entrepreneurship	Tự chọn	3	3	0	
	IT163 IU	Tối ưu hóa và ứng dụng	Optimization and Applications	Tự chọn	4	3	1	
	IT153 IU	Toán rời rạc	Discrete Mathematics	Tự chọn	3	3	0	HT: MA001IU, IT149IU
		Tự chọn tự do	Free elective	Tự chọn	4	3 or 4	1 or 0	
IX (13 tín chỉ)	IT082 IU	Thực tập công nghiệp	Internship	Bắt buộc	3	3	0	
	IT058 IU	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	10	0	
Tổng cộng					13	13	0	
	Tổng				135 (Bao gồm GDTC)			

10.3 Trình độ IE1

Bảng 9: Kế hoạch giảng dạy đối với người học đạt trình độ IE1

Học kỳ	Mã MH	Tên MH		Loại MH (bắt buộc/ tự chọn)	Tín chỉ			Môn học tiên quyết (TQ)/ Môn học học trước (HT)/ Môn học song hành (SH)
		Tiếng Anh	Tiếng Việt		Tổng cộng	Lý thu yết	Thực hàn/ Thí nghiệm	
I (34 tín chỉ)	ENTP01	Tiếng Anh tăng cường 1	Intensive English 1	bắt buộc	17	17	0	
	ENTP02	Tiếng Anh tăng cường 2	Intensive English 2	bắt buộc	17	17	0	
Tổng cộng					34	34	0	
II (15 tín chỉ)	MA001IU	Calculus 1	Toán 1	Bắt buộc	4	4	0	
	EN008IU	Academic English 1 (listening skill)	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Bắt buộc	2	2	0	
	EN007IU	Academic English 1 (writing skill)	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Bắt buộc	2	2	0	
	IT135IU	Introduction to Data Science	Nhập môn khoa học dữ liệu	Bắt buộc	3	3	0	
	IT149IU	Fundamentals of Programming	Lập trình cơ bản	Bắt buộc	4	3	1	
Tổng cộng					15	14	1	
III (17 tín chỉ)	MA026IU	Probability, Statistic & Random Process	Xác suất, thống kê và quy trình ngẫu nhiên	Bắt buộc	3	3	0	HT: MA001IU
	IT154IU	Linear Algebra	Đại số tuyến tính	Bắt buộc	3	3	0	HT: MA001IU, IT149IU
	EN012IU	Tiếng Anh chuyên ngành	Tiếng Anh chuyên	Bắt buộc	2	2	0	

		2 (kỹ năng nói)	ngành 2 (kỹ năng nói)					
	EN011IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Bắt buộc	2	2	0	HT: EN007IU
	PE015IU	Philosophy Marx – Lenin	Triết học Mác-Lênin	Bắt buộc	3	3	0	
	IT069IU	Object-Oriented Programming	Lập trình hướng đối tượng	Bắt buộc	4	3	1	TQ: IT149IU
Tổng cộng					17	16	1	
IV (17 tín chỉ)	PE016IU	Marx-Lenin Political Economy	Kinh tế chính trị Mác-Lênin	Bắt buộc	2	2	0	
	IT151IU	Statistical Method	Phương pháp thống kê	Bắt buộc	3	3	0	HT: MA001IU, IT149IU
	IT013IU	Data Structures and Algorithms	Cấu trúc dữ liệu và giải thuật	Bắt buộc	4	3	1	HT: IT069IU
	IT097IU	Principles of Database Management	Nguyên tắc của quản trị cơ sở dữ liệu	Bắt buộc	4	3	1	HT: IT149IU
	IT140IU	Khái niệm cơ bản về bảo mật dữ liệu	Khái niệm cơ bản về bảo mật dữ liệu	Bắt buộc	4	3	1	
Tổng cộng					17	14	3	
V (20 tín chỉ)	PE017IU	Scientific Socialism	Chủ nghĩa xã hội khoa học	Bắt buộc	2	2	0	HT: PE015I, PE016IU
	PE021IU	General law	Pháp luật đại cương	Bắt buộc	3	3	0	
	IT159IU	Artificial Intelligence	Trí tuệ nhân tạo	Bắt buộc	4	3	1	HT: IT013IU, MA026IU
	IT171IU	Statistical Learning	Thống kê nâng cao	Bắt buộc	4	3	1	HT: IT151IU
	IT136IU	Regression Analysis	Phân tích hồi qui	Bắt buộc	4	3	1	HT: IT013IU

	PT001IU	Physical Training 1	Giáo dục thể chất 1	Bắt buộc	3	0	3	
Tổng cộng					20	14	6	
VI (18 tín chỉ	PE018IU	History of Vietnamese Communist Party	Lịch sử Đảng cộng sản Việt Nam	Bắt buộc	2	2	0	HT: PE017IU
	IT138IU	Data Science and Data Visualization	Khoa học dữ liệu và trực quan hóa dữ liệu	Bắt buộc	4	3	1	
	IT160IU	Data Mining	Khai thác dữ liệu	Bắt buộc	4	3	1	HT: IT159IU
	IT139IU	Scalable and Distributed Computing	Tính toán khả năng mở rộng và phân bố	Bắt buộc	4	3	1	HT: IT013IU
	IT137IU	Data Analysis	Phân tích dữ liệu	Bắt buộc	4	3	1	HT: IT151IU
Tổng cộng					18	14	4	
VII (18 tín chỉ)	PE019IU	Ho Chi Minh's Thoughts	Tư tưởng Hồ Chí Minh	Bắt buộc	2	2	0	HT: PE017IU
	IT172IU	Học máy	Học máy	Bắt buộc	4	3	1	HT: IT159IU
	IT157IU	Học sâu	Học sâu	Bắt buộc	4	3	1	HT: IT013IU
				Tự chọn	4	3	1	
				Tự chọn	4	3	1	
Tổng cộng					18	14	4	
VIII (17 tín chỉ)	IT083IU	Special Study of the Field	Thực tập tốt nghiệp	Bắt buộc	3	3	0	
	IT173IU	Big Data Analytics	Phân tích dữ liệu lớn	Bắt buộc	4	3	1	
	PT002IU	Physical Training 2	Giáo dục thể chất 2	Bắt buộc	3	0	3	
				Tự chọn	3/4	3	0/1	

				Tự chọn tự do	3/4	3/4	0/1	
Tổng cộng					17	12	5	
Danh sách môn học tự chọn trong CTĐT								
	IT169IU	Phân tích chuỗi thời gian	Time Series Analysis	Tự chọn	4	3	1	HT: IT013IU, IT159IU
	IT150IU	Blockchain	Blockchain	Tự chọn	4	3	1	HT: IT140IU
	IT076IU	Công nghệ phần mềm	Software Engineering	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT170IU	Xử lý ngôn ngữ tự nhiên	Natural Language Processing	Tự chọn	4	3	1	HT: IT069IU, IT079IU, IT137IU
	IT044IU	Thiết kế giao diện và trải nghiệm người dùng	Human-Computer Interaction	Tự chọn	4	3	1	
	IT093IU	Phát triển ứng dụng web	Web Application Developmen t	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT144IU	Phân Tích Quy Trình Nghiệp Vụ	Business Process Analysis	Tự chọn	4	3	1	
	IT145IU	Hệ Thống Hỗ Trợ Quyết Định	Decision Support Systems	Tự chọn	4	3	1	HT: IT069IU
	IT146IU	Lý Thuyết Mạng Máy Tính	Theory of Networks	Tự chọn	4	3	1	
	IT056IU	Quản Trị Dự Án CNTT	IT Project Managemen t	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT094IU	Quản Lý Hệ Thống Thông Tin	Information System Managemen t	Tự chọn	3	3	0	HT: IT079IU
	IT164IU	Điện Toán Đám Mây	Cloud Computing	Tự chọn	4	3	1	HT: IT140IU

	IT120IU	Khởi nghiệp	Entrepreneurship	Tự chọn	3	3	0	
	IT163IU	Tối ưu hóa và ứng dụng	Optimization and Applications	Tự chọn	4	3	1	
	IT153IU	Toán rời rạc	Discrete Mathematics	Tự chọn	3	3	0	HT: MA001IU, IT149IU
		Tự chọn tự do	Free elective	Tự chọn	4	3 or 4	1 or 0	
IX (13 tín chỉ)	IT082IU	Thực tập công nghiệp	Internship	Bắt buộc	3	3	0	
	IT058IU	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	10	0	
Tổng cộng					13	13	0	
	Tổng				135 (Bao gồm GDTC)			

10.4 Trình độ IE0

Bảng 10: Kế hoạch giảng dạy đối với người học đạt trình độ IE0

Học kỳ	Mã MH	Tên MH		Loại MH (bắt buộc/ tự chọn)	Tín chỉ			Môn học tiên quyết (TQ)/ Môn học học trước (HT)/ Môn học song hành (SH)
		Tiếng Anh	Tiếng Việt		Tổng cộng	Lý thuyết	Thực hành/ Thí nghiệm	
I (34 tín chỉ)	ENTP00	Tiếng Anh tăng cường 0	Intensive English 0	bắt buộc	17	17	0	
	ENTP01	Tiếng Anh tăng cường 1	Intensive English 1	bắt buộc	17	17	0	
Tổng cộng					34	34	0	
Giai đoạn II								
II (15 tín chỉ)	MA001IU	Calculus 1	Toán 1	Bắt buộc	4	4	0	
	EN008IU	Academic English 1 (listening skill)	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Bắt buộc	2	2	0	
	EN007IU	Academic English 1 (writing skill)	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Bắt buộc	2	2	0	
	IT135IU	Introduction to Data Science	Nhập môn khoa học dữ liệu	Bắt buộc	3	3	0	
	IT149IU	Fundamentals of Programming	Lập trình cơ bản	Bắt buộc	4	3	1	
Tổng cộng					15	14	1	
III (17 tín chỉ)	MA026IU	Probability, Statistic & Random Process	Xác suất, thống kê và quy trình ngẫu nhiên	Bắt buộc	3	3	0	HT: MA001IU
	IT154IU	Linear Algebra	Đại số tuyến tính	Bắt buộc	3	3	0	HT: MA001IU, IT149IU

	EN012IU	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Bắt buộc	2	2	0	
	EN011IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Bắt buộc	2	2	0	HT: EN007IU
	PE015IU	Philosophy Marx – Lenin	Triết học Mác-Lênin	Bắt buộc	3	3	0	
	IT069IU	Object-Oriented Programming	Lập trình hướng đối tượng	Bắt buộc	4	3	1	TQ: IT149IU
Tổng cộng					17	16	1	
IV (17 tín chỉ)	PE016IU	Marx-Lenin Political Economy	Kinh tế chính trị Mác-Lênin	Bắt buộc	2	2	0	
	IT151IU	Statistical Method	Phương pháp thống kê	Bắt buộc	3	3	0	HT: MA001IU, IT149IU
	IT013IU	Data Structures and Algorithms	Cấu trúc dữ liệu và giải thuật	Bắt buộc	4	3	1	HT: IT069IU
	IT097IU	Principles of Database Management	Nguyên tắc của quản trị cơ sở dữ liệu	Bắt buộc	4	3	1	HT: IT149IU
	IT140IU	Khái niệm cơ bản về bảo mật dữ liệu	Khái niệm cơ bản về bảo mật dữ liệu	Bắt buộc	4	3	1	
Tổng cộng					17	14	3	
V (20 tín chỉ)	PE017IU	Scientific Socialism	Chủ nghĩa xã hội khoa học	Bắt buộc	2	2	0	HT: PE015IU, PE016IU
	PE021IU	General law	Pháp luật đại cương	Bắt buộc	3	3	0	
	IT159IU	Artificial Intelligence	Trí tuệ nhân tạo	Bắt buộc	4	3	1	HT: IT013IU, MA026IU

	IT171IU	Statistical Learning	Thống kê nâng cao	Bắt buộc	4	3	1	HT: IT151IU
	IT136IU	Regression Analysis	Phân tích hồi qui	Bắt buộc	4	3	1	HT: IT013IU
	PT001IU	Physical Training 1	Giáo dục thể chất 1	Bắt buộc	3	0	3	
Tổng cộng					20	14	6	
VI (18 tín chỉ	PE018IU	History of Vietnamese Communist Party	Lịch sử Đảng cộng sản Việt Nam	Bắt buộc	2	2	0	HT: PE017IU
	IT138IU	Data Science and Data Visualization	Khoa học dữ liệu và trực quan hóa dữ liệu	Bắt buộc	4	3	1	
	IT160IU	Data Mining	Khai thác dữ liệu	Bắt buộc	4	3	1	HT: IT159IU
	IT139IU	Scalable and Distributed Computing	Tính toán khả năng mở rộng và phân bố	Bắt buộc	4	3	1	HT: IT013IU
	IT137IU	Data Analysis	Phân tích dữ liệu	Bắt buộc	4	3	1	HT: IT151IU
Tổng cộng					18	14	4	
VII (18 tín chỉ)	PE019IU	Ho Chi Minh's Thoughts	Tư tưởng Hồ Chí Minh	Bắt buộc	2	2	0	HT: PE017IU
	IT172IU	Học máy	Học máy	Bắt buộc	4	3	1	HT: IT159IU
	IT157IU	Học sâu	Học sâu	Bắt buộc	4	3	1	HT: IT013IU
				Tự chọn	4	3	1	
				Tự chọn	4	3	1	
Tổng cộng					18	14	4	
VIII (17 tín chỉ)	IT083IU	Special Study of the Field	Thực tập tốt nghiệp	Bắt buộc	3	3	0	
	IT173IU	Big Data Analytics	Phân tích dữ liệu lớn	Bắt buộc	4	3	1	
	PT002IU	Physical Training 2	Giáo dục thể chất 2	Bắt buộc	3	0	3	

				Tự chọn	3/4	3	0/1	
				Tự chọn tự do	3/4	3/4	0/1	
Tổng cộng					17	12	5	
Danh sách môn học tự chọn trong CTĐT								
	IT169 IU	Phân tích chuỗi thời gian	Time Series Analysis	Tự chọn	4	3	1	HT: IT013I, IT159IU
	IT150 IU	Blockchain	Blockchain	Tự chọn	4	3	1	HT: IT140IU
	IT076 IU	Công nghệ phần mềm	Software Engineering	Tự chọn	4	3	1	HT: IT069I, IT079IU
	IT170 IU	Xử lý ngôn ngữ tự nhiên	Natural Language Processing	Tự chọn	4	3	1	HT: IT069I, IT079I, IT137IU
	IT044 IU	Thiết kế giao diện và trải nghiệm người dùng	Human-Computer Interaction	Tự chọn	4	3	1	
	IT093 IU	Phát triển ứng dụng web	Web Application Development	Tự chọn	4	3	1	HT: IT069I, IT079IU
	IT144 IU	Phân Tích Quy Trình Nghiệp Vụ	Business Process Analysis	Tự chọn	4	3	1	
	IT145 IU	Hệ Thống Hỗ Trợ Quyết Định	Decision Support Systems	Tự chọn	4	3	1	HT: IT069IU
	IT146 IU	Lý Thuyết Mạng Máy Tính	Theory of Networks	Tự chọn	4	3	1	
	IT056 IU	Quản Trị Dự Án CNTT	IT Project Management	Tự chọn	4	3	1	HT: IT069IU, IT079IU
	IT094 IU	Quản Lý Hệ Thống Thông Tin	Information System Management	Tự chọn	3	3	0	HT: IT079IU
	IT164 IU	Điện Toán Đám Mây	Cloud Computing	Tự chọn	4	3	1	HT: IT140IU

	IT120 IU	Khởi nghiệp	Entrepreneurs hip	Tự chọn	3	3	0	
	IT163 IU	Tối ưu hóa và ứng dụng	Optimization and Applications	Tự chọn	4	3	1	
	IT153 IU	Toán rời rạc	Discrete Mathematics	Tự chọn	3	3	0	HT: MA001IU, IT149IU
		Tự chọn tự do	Free elective	Tự chọn	4	3 or 4	1 or 0	
IX (13 tín chỉ)	IT082 IU	Thực tập công nghiệp	Internship	Bắt buộc	3	3	0	
	IT058 IU	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	10	0	
Tổng cộng					13	13	0	
	Tổng				135 (Bao gồm GDTC)			

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

Mức độ đóng góp của các môn học vào chuẩn đầu ra của CTĐT ngành Khoa học Dữ liệu được trình bày như Bảng 11. Mức độ đóng góp nhiều hay ít tuỳ thuộc vào số dấu x trong ô được đánh.

Bảng 11. Đóng góp của các môn học vào CĐR của CTĐT

Học kỳ	**Mã môn học**	**Tên môn học(4)**	**Chuẩn đầu ra của CTĐT (5)**					
			PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
I.	MA001IU	Toán 1	xx		x			
	EN008IU	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)			xxx			
	EN007IU	Tiếng Anh chuyên ngành 1 (kỹ năng viết)			xxx			
	IT135IU	Nhập môn khoa học dữ liệu	xx			x		x
	IT149IU	Lập trình cơ bản	x	xx				
II.	MA026IU	Xác suất, thống kê và quy trình ngẫu nhiên	xx					
	IT154IU	Đại số tuyến tính	xx		x			
	EN012IU	Tiếng Anh chuyên ngành 2 (kỹ năng nói)			xxx			

	EN011IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)			xxx			
	PE015IU	Triết học Mác-Lênin				xx		
	IT069IU	Lập trình hướng đối tượng	xx	xxx				x
III.	PE016IU	Kinh tế chính trị Mác-Lênin				xx		
	IT151IU	Phương pháp thống kê	xx	x				
	IT013IU	Cấu trúc dữ liệu và giải thuật	xx	xxx				x
	IT097IU	Nguyên tắc của quản trị cơ sở dữ liệu	xx	xxx				x
	IT140IU	Khái niệm cơ bản về bảo mật dữ liệu		xx	x			
IV.	PE017IU	Chủ nghĩa xã hội khoa học				xx		
	PE021IU	Pháp luật đại cương				xx	x	
	IT159IU	Trí tuệ nhân tạo	xx	xxx				x
	IT171IU	Thống kê nâng cao	xxx	x				
	IT136IU	Phân tích hồi qui	xxx	xx				
	PT001IU	Giáo dục thể chất 1					x	
V.	PE018IU	Lịch sử Đảng cộng sản Việt Nam				x		
	IT138IU	Khoa học dữ liệu và trực quan hóa dữ liệu	xx	x	xx			
	IT160IU	Khai thác dữ liệu	xxx				x	xx
	IT139IU	Tính toán khả năng mở rộng và phân bố	xx	xxx				x
	IT137IU	Phân tích dữ liệu	xxx	xx				
VI.	PE019IU	Tư tưởng Hồ Chí Minh				xx		
	IT172IU	Học máy	xx	xx				x
	IT157IU	Học sâu	xx	xx				x
	Tự chọn (Sinh viên chọn 2 môn trong danh sách bên dưới)							
	IT169IU	Phân tích chuỗi thời gian	xx	xxx				x
	IT150IU	Blockchain	xx	xx				x
	IT076IU	Công nghệ phần mềm	xx	xxx				x
	IT044IU	Thiết kế giao diện và trải nghiệm người dùng	xx	xx				

	IT144IU	Phân Tích Quy Trình Nghiệp Vụ	xx	xx		x		
	IT145IU	Hệ Thống Hỗ Trợ Quyết Định	xx	xx		x		
	IT146IU	Lý Thuyết Mạng Máy Tính	x				x	x
	IT094IU	Quản Lý Hệ Thống Thông Tin	x				xx	x
	IT164IU	Điện Toán Đám Mây	x	xx	x			
VII.	IT083IU	Thực tập tốt nghiệp						
	IT173IU	Phân tích dữ liệu lớn						
	PT002IU	Giáo dục thể chất 2					x	
	Tự chọn (Sinh viên chọn 1 môn trong danh sách bên dưới)							
	IT120IU	Khởi nghiệp	x			x		
	IT170IU	Xử lý ngôn ngữ tự nhiên	x	xx	x			
	IU093IU	Phát triển ứng dụng web	xx	xx				
	IT056IU	Quản Trị Dự Án CNTT	x			x	xx	
	IT163IU	Tối ưu hoá và Ứng dụng	xx	xx				x
	IT153IU	Toán rời rạc	x	x				
		Tự chọn tự do						
VIII.	IT082IU	Thực tập công nghiệp				x		x
	IT083IU	Thực tập tốt nghiệp	xxx	xx				x
	IT058IU	Luận văn tốt nghiệp	xxx	xxx				x

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

1. Triết học Mác-Lênin (Philosophy Marxist-Lenin)

⁻ Mã MH: PE015IU

⁻ Số tín chỉ: 3 (3,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Môn học trang bị cho sinh viên những kiến thức cơ bản về triết học Mác-Lênin

2. Kinh tế chính trị Mác-Lênin (Marxist-Lenin Political Economy)

⁻ Mã MH: PE016IU

⁻ Số tín chỉ: 2 (2,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Nội dung chương trình gồm 6 chương: Trong đó chương 1 bàn về đối tượng, phương pháp nghiên cứu và chức năng của Kinh tế chính trị Mác-Lênin. Từ chương 2 đến chương 6 trình bày nội dung cốt lõi của Kinh tế chính trị Mác-Lênin theo

mục tiêu của môn học. Cụ thể các vấn đề như: Hàng hóa, thị trường và vai trò của các chủ thể trong nền kinh tế thị trường; Sản xuất giá trị thặng dư trong nền kinh tế thị trường; Cạnh tranh và độc quyền trong nền kinh tế thị trường; Kinh tế thị trường định hướng xã hội chủ nghĩa và các quan hệ lợi ích kinh tế ở Việt Nam; Công nghiệp hóa, hiện đại hóa và hội nhập kinh tế quốc tế ở Việt Nam.

3. Chủ nghĩa xã hội khoa học (Scientific Socialism)

⁻ Mã MH: PE017IU

⁻ Số tín chỉ: 2 (2,0)

⁻ Môn học trước: Kinh tế chính trị Mác - Lênin, Triết học Mác - Lênin

⁻ Mô tả vắn tắt nội dung: Môn học trang bị cho sinh viên những kiến thức cơ bản về chủ nghĩa xã hội khoa học.

4. Lịch sử Đảng Cộng sản Việt Nam (History of Vietnamese Communist Party)

⁻ Mã MH: PE018IU

⁻ Số tín chỉ: 2 (2,0)

⁻ Môn học trước: Triết học Mác - Lênin, Kinh tế chính trị Mác - Lênin, Chủ nghĩa xã hội khoa học

⁻ Mô tả vắn tắt nội dung: Môn học trang bị cho sinh viên những kiến thức cơ bản về lịch sử Đảng Cộng Sản Việt Nam.

5. Tư tưởng Hồ Chí Minh (Ho Chi Minh's Thoughts)

⁻ Mã MH: PE019IU

⁻ Số tín chỉ: 2 (2,0)

⁻ Môn học trước: Triết học Mác - Lênin, Kinh tế chính trị Mác - Lênin, Chủ nghĩa xã hội khoa học

⁻ Mô tả vắn tắt nội dung: Môn học 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 đoàn kết quốc tế; về văn hóa, đạo đức, con người.

6. Pháp luật đại cương

⁻ Mã MH: PE021IU

⁻ Số tín chỉ: 3 (3,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Khóa học sẽ giới thiệu cho sinh viên hệ thống pháp luật Việt Nam. Đặc biệt, sinh viên sẽ hiểu được quyền và nghĩa vụ của mình trong Hiến pháp, Luật hình sự, luật hành chính, luật dân sự, luật lao động và luật doanh nghiệp của Việt Nam. Từ đó, học sinh sẽ nâng cao nhận thức về trách nhiệm của mình trong việc đảm bảo công lý, bao gồm cả việc chấm dứt tham nhũng trong xã hội.

7. Toán 1

⁻ Mã MH: MA001IU

⁻ Số tín chỉ: 4 (4,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Nội dung chính: 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.

8. Đại số tuyến tính (Linear Algebra 3)

⁻ Mã MH: IT154IU

⁻ Số tín chỉ: 3 (3,0)

⁻ Môn học trước: Toán 1, Lập trình cơ bản

⁻ Mô tả vắn tắt nội dung: Đại số tuyến tính cung cấp một khuôn khổ toán học để tổ chức thông tin và sau đó sử dụng thông tin đó để giải quyết các vấn đề, đặc biệt là các vấn đề phân tích dữ liệu. Đại số tuyến tính rất cần thiết để hiểu và tạo ra các thuật toán học máy, đặc biệt là mạng thần kinh và các mô hình học sâu.

⁻ Khóa học này sẽ cung cấp cho sinh viên kiến thức đại số tuyến tính cần thiết cho học máy và mô hình mạng thần kinh. Học sinh sẽ tìm hiểu tổng quan về ma trận cơ bản và đại số vector như được áp dụng cho các hệ thống tuyến tính. Sau đó, họ sẽ học cách thao tác ma trận để có được kiến thức hữu ích từ dữ liệu, định lượng mức độ học tập và tối ưu hóa tốc độ học tập trong không gian vector và chuyển đổi tuyến tính để khám phá dữ liệu. Các bài học và bài tập thực hành sẽ trang bị cho sinh viên nền tảng toán học cần thiết để xây dựng và đào tạo các mạng thần kinh đơn giản trong các ứng dụng khai thác dữ liệu.

9. Xác suất, thống kê và quy trình ngẫu nhiên (Probability, Statistic & Random Process)

⁻ Mã MH: MA026IU

⁻ Số tín chỉ: 3 (3,0)

⁻ Môn học trước: Toán 1

⁻ Mô tả vắn tắt nội dung: Sinh viên sẽ được cung cấp các kỹ năng sử dụng dữ liệu từ nhiều nguồn khác nhau, được làm quen với môi trường cơ sở dữ liệu và điện toán hiện đại, chẳng hạn như R/Python và được tiếp xúc với các nghiên cứu điển hình từ bên ngoài lớp học. Thông qua học phần này, sinh viên sẽ làm quen với những thách thức của khoa học dữ liệu đương đại và hiểu rõ hơn về các kỹ năng nền tảng cần thiết để biến dữ liệu thành thông tin.

10. Phương pháp thống kê (Statistical Method)

⁻ Mã MH: IT151IU

⁻ Số tín chỉ: 3 (3,0)

⁻ Môn học trước: Toán 1, Lập trình cơ bản

⁻ Mô tả vắn tắt nội dung: Cung cấp cho sinh viên nền tảng về các phương pháp thống kê giúp phân tích dữ liệu, bao gồm tóm tắt và mô tả dữ liệu và kỹ thuật suy luận. Chủ đề bao gồm phân phối xác suất cơ bản (ví dụ như phân phối chuẩn, và phân phối nhị thức), giá trị kỳ vọng, ước lượng (hợp lý cực đại, khoảng tin cậy), kiểm tra giả thuyết và phân tích hồi quy bội.

11. Thống kế nâng cao (Statistical Learning)

⁻ Mã MH: IT171IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Phương pháp thống kê

⁻ Mô tả vắn tắt nội dung: Đây là khóa học cấp đại học nâng cao giới thiệu phương pháp Bayesian về suy luận thống kê để phân tích dữ liệu trong nhiều ứng dụng, đặc biệt là trong Khoa học dữ liệu. Khóa học này cung cấp kiến thức về lý thuyết suy luận Bayes và phân tích dữ liệu bằng phần mềm thống kê (chủ yếu bằng Python) cũng sẽ được nhấn mạnh. Các chủ đề bao gồm: so sánh phương pháp Bayesian và phương pháp thường xuyên, đặc tả mô hình Bayes, đặc tả trước, cơ bản về lý thuyết quyết định, chuỗi Markov Monte Carlo, hệ số Bayes, Bayes thực nghiệm, hồi quy tuyến tính Bayes và mô hình tuyến tính tổng quát, mô hình phân cấp

12. Tiếng Anh chuyên ngành 1- Kỹ năng Nghe (Academic English 1 - Listening skill)

⁻ Mã MH: EN008IU

⁻ Số tín chỉ: 2(2,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: 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. Cùng với các kỹ năng nghe, sinh viên cũng sẽ trau dồi thêm vốn từ vựng học thuật.

13. Tiếng Anh chuyên ngành 1 - Kỹ năng Viết (Academic English 1 - Writing skill)

⁻ Mã MH: EN007IU

⁻ Số tín chỉ: 2(2,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: 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

14. Tiếng Anh chuyên ngành 2 - Kỹ năng Nói (Academic English 2 - Speaking skill)

⁻ Mã MH: EN012IU

⁻ Số tín chỉ: 2 (2,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: 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.

15. Tiếng Anh chuyên ngành 2 - Kỹ năng Viết (Academic English 2 - Writing skill)

⁻ Mã MH: EN011IU

⁻ Số tín chỉ: 2 (2,0)

⁻ Môn học trước: Tiếng anh chuyên ngành 1 (Kỹ năng Viết)

⁻ Mô tả vắn tắt nội dung: Khóa 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 khóa 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 môn học của mình.

16. Nhập môn khoa học dữ liệu (Introduction to Data Science)

⁻ Mã MH: IT135IU

⁻ Số tín chỉ: 3 (3,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung**:** Khóa học nhằm giới thiệu chung về bốn khía cạnh chính của khoa học dữ liệu: truy xuất và mô phỏng dữ liệu, trực quan dữ liệu, tính toán thống kê và học máy, và trình bày và giao tiếp. Học sinh sẽ sử dụng dữ liệu từ nhiều nguồn, được giới thiệu về các môi trường máy tính và cơ sở dữ liệu hiện đại như R/Python và SQL, và được tiếp xúc với các nghiên cứu bên ngoài lớp học. Thông qua khóa học này, sinh viên này sẽ làm quen với những thách thức của khoa học dữ liệu đương đại và đạt được các kỹ năng cơ bản cần thiết để chuyển dữ liệu thành thông tin.

17. Lập trình cơ bản (Fundamentals of Programming)

⁻ Mã MH: IT149IU

⁻ Số tín chỉ: 3 (3,1)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Khóa học này bao gồm sự phát triển thuật toán và các nguyên tắc lập trình máy tính sử dụng các ngôn ngữ phổ biến trong phân tích dữ liệu, như là C/C++ hay R/Python. Các chủ đề bao gồm giới thiệu về máy tính và tính toán, phát triển chương

trình, cú pháp ngôn ngữ lập trình, và các phương pháp số nguyên tố cho các nhà khoa học dữ liệu. Môi trường lập trình và các tiện ích cũng được giới thiệu.

18. Lập trình hướng đối tượng (Object-Oriented Programming)

⁻ Mã MH: IT069IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học tiên quyết: Lập trình cơ bản

⁻ Mô tả vắn tắt nội dung: Khái niệm cơ bản về lập trình và cấu trúc dữ liệu trong Java. Các kiểu dữ liệu cơ bản: các vòng lặp, các mảng, đệ quy và các con trỏ. Thiết kế hướng đối tượng: các lớp, kế thừa, hàm chồng, và đa hình; Các kiểu dữ liệu trừu tượng: danh sách, danh sách liên kết, ngăn xếp và hàng đợi; Giới thiệu về phân tích thuật toán: ký hiệu O, tìm kiếm và sắp xếp.

19. Cấu trúc dữ liệu và giải thuật (Data Structures and Algorithms)

⁻ Mã MH: IT013IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Lập trình hướng đối tượng

⁻ Mô tả vắn tắt nội dung: Điều tra các tính chất thiết yếu của cấu trúc dữ liệu và các thuật toán để vận hành chúng; sử dụng các cấu trúc này làm công cụ hỗ trợ thiết kế thuật toán; để mở rộng cho các kỹ thuật tìm kiếm, phân loại và băm.

20. Nguyên tắc của quản trị cơ sở dữ liệu (Principles of Database Management)

⁻ Mã MH: IT079IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Lập trình cơ bản

⁻ Mô tả vắn tắt nội dung: Môn này giới thiệu cho sinh viên các khái niệm cơ bản về thiết kế cơ sở dữ liệu và hiện thực. Sinh viên sẽ học các kỹ thuật thiết kế cơ sở dữ liệu, bao gồm thiết kế quan hệ và phân tích quan hệ - thực thể (E-R). Các truy vấn cơ sở dữ liệu bằng cách sử dụng SQL được trình bày trong các bài giảng và được hỗ trợ bởi các bài tập thực hành.

21. Trí tuệ nhân tạo (Artificial Intelligence)

⁻ Mã MH: IT159IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Câu trúc dữ liệu và giải thuật; Xác suất, thống kê và quy trình ngẫu nhiên

⁻ Mô tả vắn tắt nội dung: Khóa học này giới thiệu các khái niệm cơ bản về trí tuệ nhân tạo (AI). Các chủ đề bao gồm: lịch sử AI, các tác nhân, tìm kiếm (không gian tìm kiếm, tìm kiếm không thông tin và thông tin, thỏa mãn ràng buộc, chơi trò chơi), mô tả tri thức (mã hóa logic về tri thức miền, các hệ thống lập luận logic), lập kế hoạch, và ngôn ngữ

Lisp. Khóa học phù hợp với những sinh viên muốn đạt được một nền tảng kỹ thuật vững chắc và chuẩn bị cho công việc tiên tiến hơn trong AI.

22. Khái niệm cơ bản về bảo mật dữ liệu (Fundamental Concepts of Data Security)

⁻ Mã MH: IT140IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Khóa học này giới thiệu cho sinh viên về các nguyên tắc và hệ thống mật mã (đối xứng và mã khóa công khai), và các ứng dụng của chúng trong bảo mật dữ liệu, truyền thông an toàn, chứng thực và ủy quyền. Những nguyên tắc cốt lõi này sẽ được áp dụng cho các khái niệm quản lý rủi ro thông tin, phân tích và xử lý các hệ thống bị xâm nhập. Các đạo đức về tội phạm máy tính, quyền riêng tư và sở hữu trí tuệ được đề cập chi tiết. Cuối cùng, khóa học sẽ bao gồm các tiêu chí và các điều khiển để phân loại thông tin.

23. Phân tích dữ liệu (Data Analysis)

⁻ Mã MH: IT137IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Phương pháp thống kê

⁻ Mô tả vắn tắt nội dung: Khóa học này giới thiệu các nguyên tắc cơ bản của phân tích dữ liệu thông qua các quá trình phân tích dữ liệu cùng với thống kê mô tả và thống kê suy diễn. Sinh viên sẽ học cách thu thập dữ liệu, xử lý và biến chúng thành thông tin hữu ích và tri thức có ý nghĩa quan trọng trong việc ra quyết định. Từ dữ liệu thô đến thông tin hữu ích rồi đến tri thức, sinh viên sẽ kiểm tra một số số liệu và nghiên cứu tình huống từ các góc nhìn khác nhau. Sinh viên có thể phát triển các giải pháp thực tế cho các vấn đề trong kinh doanh và kỹ thuật, và đạt được kinh nghiệm thực tế từ việc sử dụng các công cụ phân tích dữ liệu hiện đại.

24. Phân tích hồi quy (Regression Analysis)

⁻ Mã MH: IT136IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Phân tích hồi quy là một trong những phương pháp mạnh mẽ nhất trong thống kê để xác định mối quan hệ giữa các biến và sử dụng các mối quan hệ này để dự báo các quan sát trong tương lai. Nền tảng của phân tích hồi qui rất hữu ích cho các bài toán mô hình. Các mô hình hồi quy được sử dụng để dự đoán và dự báo kết quả trong tương lai. Sự phổ biến của nó trong tài chính rất cao; nó cũng rất phổ biến trong các lĩnh vực khác như khoa học sinh học, quản lý, và kỹ thuật.

25. Khoa học dữ liệu và trực quan hóa dữ liệu (Data Science and Data Visualization)

⁻ Mã MH: IT138IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Mục tiêu của khóa học này là giới thiệu cho sinh viên các nguyên tắc, phương pháp và kỹ thuật then chốt để phân tích trực quan dữ liệu hiệu quả. Khóa học bắt đầu với mục đích và các nguyên tắc chính của trực quan hóa dữ liệu. Khóa học tiếp tục với các khía cạnh khác nhau của việc trực quan hóa bao gồm kỹ thuật và phương pháp mô tả các loại dữ liệu khác nhau, để thảo luận và phân tích trực quan hóa. Toàn bộ khóa học, sinh viên sẽ được giới thiệu với nhiều hệ thống trực quan hóa và công cụ trực quan thông qua các bài tập thực hành.

26. Tính toán khả năng mở rộng và phân bố (Scalable and Distributed Computing)

⁻ Mã MH: IT139IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Cấu trúc dữ liệu và giải thuật

⁻ Mô tả vắn tắt nội dung: Khóa học này trình bày lý thuyết, thiết kế, hiện thực, và phân tích các hệ thống phân bố. Thông qua các bài giảng lớp học, phòng thí nghiệm, dự án và bài tập, sinh viên có thể học các nguyên tắc cơ bản của hệ thống phân bố, mô hình hệ thống, gọi thủ tục từ xa, các đối tượng phân bố, hỗ trợ hệ điều hành, bảo mật trong các hệ thống phân bố, các hệ thống tập tin phân bố, đồng thời, giao dịch và đồng bộ hóa, sao chép. Khóa học cũng bao gồm các chủ đề nâng cao liên quan đến công nghệ xử lý dữ liệu phân bố và đám mây: phân vùng dữ liệu, sơ đồ lưu trữ, xử lý luồng, và các thuật toán song song. Các giờ thực hành của khóa học cho phép khai thác Internet và các dịch vụ điện toán đám mây hiện đại chạy trên nhiều trung tâm dữ liệu được phân bố theo địa lý: Google, Yahoo, Facebook, iTunes, Amazon, eBay, Bing, v.v ...

27. Khai thác dữ liệu (Data Mining)

⁻ Mã MH: IT160IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Lập trình hướng đối tượng

⁻ Mô tả vắn tắt nội dung: Môn học này giới thiệu cho sinh viên các nguyên tắc và thuật toán khai thác dữ liệu, và các yêu cầu của quá trình khai thác dữ liệu. Sinh viên sẽ nghiên cứu các khái niệm khai thác dữ liệu và các thuật toán để giải quyết các vấn đề về khám phá tri thức. Sinh viên có thể phát triển kỹ năng sử dụng phần mềm khai thác dữ liệu gần đây để giải quyết các vấn đề thực tiễn, và có được kinh nghiệm làm việc nghiên cứu và nghiên cứu độc lập.

28. Học sâu (Deep Learning)

⁻ Mã MH: IT157IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Cấu trúc dữ liệu và giải thuật

⁻ Mô tả vắn tắt nội dung: Môn học này giúp sinh viên hiểu được khả năng, thách thức và hậu quả của việc học sâu và chuẩn bị cho sinh viên tham gia vào sự phát triển của công nghệ AI hàng đầu. Trong khóa học này, sinh viên sẽ xây dựng và đào tạo các kiến trúc mạng thần kinh như Mạng thần kinh phức tạp, Mạng thần kinh tái phát, Máy biến áp và học cách làm cho chúng tốt hơn với các chiến lược như Dropout, BatchNorm, v.v. Sinh viên sẵn sàng để nắm vững các khái niệm lý thuyết và các ứng dụng công nghiệp bằng Python và PyTorch và giải quyết các trường hợp thực tế.

29. Máy học (Machine Learning)

⁻ Mã MH: IT172IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Trí tuệ nhân tạo

⁻ Mô tả vắn tắt nội dung: Mục tiêu của môn học này nhằm trang bị cho sinh viên các kiến thức nền tảng cũng như các kỹ năng thực tế trong việc phát triển giải pháp cho dữ liệu lớn thông qua việc sử dụng các công cụ quản lý dữ liệu lớn, đặc biệt là các hệ sinh thái của Hadoop. Môn học cũng tập trung vào các mô hình lập trình như MapReduce, Hive, Pig, and Apache Spark.

30. Phân tích dữ liệu lớn (Big Data Analytics)

⁻ Mã MH: IT173IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Phân tích dữ liệu

⁻ Mô tả vắn tắt nội dung: Môn học này cung cấp kiến thức tổng quát về công nghệ được sử dụng trong các giải pháp Dữ liệu lớn (Big Data). Nó bao gồm việc phát triển các giải pháp Big Data sử dụng hệ thống Hadoop, bao gồm MapReduce, HDFS, khung lập trình Apache Pig và Hive. Khóa học này giúp sinh viên xây dựng một nền tảng để làm việc với các giải pháp dữ liệu lớn của Apache.

31. Phân tích chuỗi thời gian (Time Series Analysis)

⁻ Mã MH: IT169IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Khai thác dữ liệu; Cấu trúc dữ liệu và giải thuật

⁻ Mô tả vắn tắt nội dung: Khoá học giới thiệu các phương pháp cơ bản về phân tích và dự báo chuỗi thời gian. Các chủ đề bao gồm stationary processes, ARMA models, spectral analysis, forecasting using ARMA models, nonstationary and seasonal time series models, multivariate time series, state-space models, and forecasting techniques.

32. Blockchain

⁻ Mã MH: IT150IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Môn học này giới thiệu cho sinh viên kiến thức cơ bản về công nghệ blockchain và các ứng dụng. Sinh viên sẽ được học các khái niệm về blockchain và các nguyên lý hoạt động của blockchain. Môn học này sẽ đề cập tất cả các vấn đề liên quan đến blockchain. Bắt đầu bằng việc cung cấp nền tảng về blockchain, cryptography, và các kiến thức cơ bản về bitcoins. Sau đó, các ứng dụng của công nghệ blockchain trong các lĩnh vực khác nhau như tài chính, y tế, chuỗi cung ứng … cũng được giới thiệu. Một bức tranh toàn diện về hệ sinh thái xung quanh công nghệ blockchain technology và các xu hướng phát triển cũng được đề cập.

33. Công nghệ phần mềm (Software engineering)

⁻ Mã MH: IT076IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Lập trình hướng đối tượng; Nguyên tắc của quản trị cơ sở dữ liệu

⁻ Mô tả vắn tắt nội dung: Khoá học này cung cấp cho sinh viên những kiến thức cơ bản về các khái niệm, phương pháp và qui trình của Kỹ thuật phần mềm. Nó bao gồm các môn học về mô hình quy trình phần mềm, phương pháp phát triển linh hoạt (agile), mô hfinh kỹ thuật và phân tích yêu cầu, phương pháp thiết kế và phát triển phần mềm, chiến lược kiểm thử và đánh giá phần mềm.

⁻ Sinh viên áp dụng các phương pháp phân tích yêu cầu, lập kế hoạch, thiết kế, triển khai và kiểm thử linh hoạt hiện đại vào công việc của dự án kỹ thuật phần mềm trong các nhóm nhỏ.

34. Xử lý ngôn ngữ tự nhiên (Natural Language Processing)

⁻ Mã MH: IT170IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Cấu trúc dữ liệu và giải thuật; Nguyên tắc của quản trị cơ sở dữ liệu; Phân tích dữ liệu

⁻ Mô tả vắn tắt nội dung: Môn học cung cấp cho học viên kiến thức nền tảng về phương pháp xử lý ngôn ngữ tự nhiên. Đồng thời, các hướng tiếp cận mới theo hướng máy học, học sâu cho xử lý ngôn ngữ tự nhiên cũng được giới thiệu

35. Thiết kế giao diện và trải nghiệm người dùng (Human-Computer Interaction)

⁻ Mã MH: IT044IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Môn học này nhấn mạnh việc kết hợp lý thuyết về thiết kế trải nghiệm người dùng với các phương pháp thực hành phổ biến trong các ngành công nghiệp và giáo dục để tạo ra những trải nghiệm tương tác hiệu quả. Sinh viên sẽ được học về quy trình thiết kế tập trung vào người dùng (User-Centred Design), với việc đặt sự chú trọng vào việc thiết kế sản phẩm, ứng dụng và phần mềm cho người dùng. Cụ thể, sinh

viên sẽ học về các kỹ thuật thu thập và hiểu các yêu cầu của người dùng cuối, tầm quan trọng của thiết kế thông thường và khả năng tiếp cận, và các phương pháp để thực hiện prototyping nhanh chóng. Ngoài ra, sinh viên sẽ tập trung vào việc tích hợp kiến thức vào thực tế qua việc thiết kế và tiến hành các nghiên cứu sử dụng. Họ sẽ áp dụng kiến thức này để thiết kế và đánh giá một thiết kế kỹ thuật số bằng các công cụ tiêu chuẩn trong ngành.

36. Phát triển ứng dụng web (Web Application Development)

⁻ Mã MH: IT093IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Lập trình hướng đối tượng; Nguyên tắc của quản trị cơ sở dữ liệu

⁻ Mô tả vắn tắt nội dung: Khóa học này cung cấp cho sinh viên những kiến thức cơ bản về thiết kế web và lập trình web. Nó cung cấp các khái niệm và mô hình của HTML, Java Server Page, Java Bean, mô hình MVC, các tiện ích Java và môi trường phát triển, các khung công tác Java mở rộng, một số khung công tác mới với các ngôn ngữ lập trình khác nhau. Để phát triển kỹ năng hiểu và đánh giá các hệ thống dựa trên web, cũng như phát triển kỹ năng thiết kế và phát triển các ứng dụng dựa trên web.

37. Phân Tích Quy Trình Nghiệp Vụ (Business Process Analysis)

⁻ Mã MH: IT144IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Mỗi tổ chức phát triển mạnh việc thực hiện các quy trình kinh doanh hiệu quả để tăng nhân viên và sự hài lòng của khách hàng, tăng cường hiệu suất kinh doanh, giảm chi phí và tăng năng suất. Tất cả các hoạt động bao gồm thay đổi các quy trình quan trọng, sáp nhập hoặc chia tách đơn vị kinh doanh yêu cầu một khung quản lý thống nhất về những thay đổi. Khóa học nhằm cung cấp kiến thức cơ bản về phân tích quá trình kinh doanh, cải tiến và đánh giá. Nhiều phương pháp, kỹ thuật và công cụ phần mềm được sử dụng để phân tích và quản lý cải tiến quá trình kinh doanh cũng được giới thiệu trong khóa học.

38. Hệ Thống Hỗ Trợ Quyết Định (Decision Support Systems)

⁻ Mã MH: IT145IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Lập trình hướng đối tượng

⁻ Mô tả vắn tắt nội dung: Hệ thống Hỗ trợ Quyết định (DSS) là một hệ thống dựa trên máy tính tương tác hoặc hệ thống con nhằm giúp các nhà hoạch định chính sách sử dụng công nghệ truyền thông, dữ liệu, tài liệu, kiến thức và / hoặc mô hình để xác định và giải quyết các vấn đề, hoàn thành các tác vụ xử lý quyết định, và làm quyết định. DSS mô phỏng các chức năng quyết định nhận thức của con người dựa trên phương pháp luận trí tuệ nhân tạo (bao gồm hệ thống chuyên gia, khai thác dữ liệu, máy học, kết nối, lý luận logic, vv) để thực hiện các chức năng hỗ trợ quyết định. DSS là một thuật ngữ chung cho

bất kỳ ứng dụng máy tính nào để trợ giúp một người hoặc nhóm khả năng đưa ra quyết định. Ngoài ra, DSS đề cập đến một lĩnh vực nghiên cứu bao gồm việc thiết kế và nghiên cứu DSS trong bối cảnh sử dụng.

39. Lý Thuyết Mạng Máy Tính (Theory of Networks)

⁻ Mã MH: IT146IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Khóa học giới thiệu sự kết nối của cuộc sống hiện đại, trả lời

⁻ câu hỏi làm sao các thế giới xã hội, kinh tế, và công nghệ của chúng ta được kết nối lại với nhau. Sinh viên sẽ nghiên cứu các mô hình mạng hiện đại, chẳng hạn như, lý thuyết trò chơi, cấu trúc của Internet, lan truyền trong xã hội, sự lan truyền của quyền lực xã hội và thông tin phổ biến, và các luồng thông tin.

40. Quản Trị Dự Án CNTT (IT Project Management)

⁻ Mã MH: IT056IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Lập trình hướng đối tượng

⁻ Mô tả vắn tắt nội dung: Khóa học này cung cấp cho sinh viên kiến thức về quản lý dự án phần mềm cơ bản, đặc biệt chú trọng đến các sản phẩm phần mềm, quản lý dự án và các vấn đề đương đại trong việc cung cấp các giải pháp phần mềm cho doanh nghiệp. Nó xem xét các phương pháp theo kế hoạch (plan-driven) và nhanh (agile), các kỹ thuật ước lượng, quản lý thay đổi, quản lý rủi ro và vai trò của quản lý dự án trong kinh doanh. Và nó xác định các khía cạnh quản lý và báo cáo về quản lý cần thiết từ khi bắt đầu thực hiện dự án phát triển phần mềm.

41. Quản Lý Hệ Thống Thông Tin (Information System Management)

⁻ Mã MH: IT094IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Nguyên tắc của quản trị cơ sở dữ liệu

⁻ Mô tả vắn tắt nội dung: Tập trung vào cách các doanh nghiệp sử dụng hệ thống thông tin và ảnh hưởng đến hoạt động kinh doanh của doanh nghiệp. Mặc dù công nghệ của các hệ thống thông tin (tức là công nghệ thông tin) được trình bày và thảo luận, vấn đề chính là làm thế nào các công nghệ này được sử dụng để giải quyết các vấn đề kinh doanh và khai thác các cơ hội.

42. Điện Toán Đám Mây (Cloud Computing)

⁻ Mã MH: IT164IU

⁻ Số tín chỉ: 4 (3,1)

⁻ Môn học trước: Khái niệm cơ bản về bảo mật dữ liệu

⁻ Mô tả vắn tắt nội dung: Môn học này giới thiệu các khái niệm cơ bản về điện toán đám mây di động bao gồm công nghệ tính toán di động trên điện thoại thông minh, công nghệ điện toán đám mây trên trung tâm dữ liệu, sự kết hợp của điện thoại di động và điện toán đám mây và các ứng dụng, và lập trình trên điện thoại thông minh sử dụng dịch vụ trung tâm dữ liệu. Thông qua bài giảng trên lớp, bài thực hành, bài tập nhỏ và lớn, sinh viên có kiến thức về lập trình trên điện thoại thông minh, các nền tảng điện toán đám mây, công nghệ hỗ trợ cho điện toán đám mây di động và ứng dụng. Các bài thực hành tập trung vào nền tảng Java, Android và khai thác dịch vụ điện toán đám mây và dịch vụ Internet vận hành trên một số trung tâm dữ liệu phân tán toàn cầu như: Google, Yahoo, Facebook, iTunes, Amazon, eBay, Bing, etc.

43. Khởi Nghiệp (Entrepreneurship)

⁻ Mã MH: IT120IU

⁻ Số tín chỉ: 3 (3,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Nội dung môn học bao gồm: Giới thiệu về kinh tế vĩ mô, vi mô; các thách thức và rủi ro của doanh nghiệp mới, đặc biệt là doanh nghiệp công nghệ; cách thức chọn lựa loại hình doanh nghiệp và tổ chức cấu trúc doanh nghiệp; hoạch định chiến lược và xây dựng phương án vốn; kiểm soát nội bộ và kiểm soát rủi ro; quản lý tài chính và xây dựng hệ thống kế toán; điều hành doanh nghiệp và quan hệ với bên ngoài; xây dựng phương án kinh doanh và cách thức đánh giá hiệu quả hoạt động; kỹ năng làm việc nhóm và hợp tác trong một doanh nghiệp công nghệ.

44. Tối ưu hóa và Ứng dụng (Optimization and Applications)

⁻ Mã MH: IT163IU

⁻ Số tín chỉ: 3 (3,0)

⁻ Môn học trước: Không

⁻ Mô tả vắn tắt nội dung: Khóa học này là giới thiệu các phương pháp cơ bản được sử dụng trong các hoạt động xác định nghiên cứu và sử dụng phân tích số và đại số tuyến tính để giải quyết công nghiệp vấn đề kỹ thuật. Các chủ đề cần được đề cập bao gồm: công thức vấn đề, phương thức simplex trong bảng mẫu, lý thuyết nhị nguyên, giới thiệu về hình học của phương thức simplex, phân tích độ nhạy, vận chuyển và lưu lượng mạng.

45. Toán rời rạc (Discrete Mathematics)

⁻ Mã MH: IT153IU

⁻ Số tín chỉ: 3 (3,0)

⁻ Môn học trước: Toán1; Lập tình cơ bản

⁻ Mô tả vắn tắt nội dung: Môn học này cung cấp cho sinh viên những kiến thức cơ bản về toán rời rạc. Nhằm phát triển khả năng lập luận và suy nghĩ theo cách toán học và logic. Đây là môn học có hướng ứng dụng dựa trên việc nghiên cứu các sự kiện xả ra theo cách rời rạc trong các lĩnh vực kinh doanh, công nghiệp, và các lĩnh vực số. Sinh viên sẽ

được giới thiệu với các công cụ toán học như logic và lý thuyết tập hợp, lý thuyết số và lý thuyết đồ thị. Ứng dụng thực tế sẽ được giới thiệu trong suốt khoá học.

46. Thực tập công nghiệp (Internship)

⁻ Mã MH: IT082IU

⁻ Số tín chỉ: 2 (2,0)

⁻ Điều kiện: Sinh viên làm thực tập vào cuối năm 3

⁻ Mô tả vắn tắt nội dung: Sinh viên năm thứ 3 hoặc 4 đăng ký môn thực tập tốt nghiệp vào các học kỳ hè. Môn học này yêu cầu sinh viên làm việc tại các tổ chức hoặc doanh nghiệp liên quan đến CNTT từ tháng 6 đến tháng 9. Mỗi sinh viên có 1 giảng viên hướng dẫn ở Khoa và 1 người hướng dẫn ở tổ chức hoặc doanh nghiệp để thực hiện một dự án kỹ thuật, đồng thời tham gia học tập các kỹ năng mềm khác. Thời gian thực tập tối thiểu là 8 tuần và 3 buổi/tuần và sinh viên báo cáo tiến độ cho giảng viên hướng dẫn sau 3 tuần nhận dự án. Tùy theo yêu cầu dự án của tổ chức hoặc doanh nghiệp, sinh viên có thể thu xếp làm thời gian dài hơn. Cuối thời gian thực tập, sinh viên nộp báo cáo thực tập và báo cáo đánh giá từ người hướng dẫn ở tổ chức hoặc doanh nghiệp về cho Khoa. Giảng viên hướng dẫn đọc báo cáo và xác nhận điểm môn thực tập cho sinh viên. Ngoài ra, sinh viên cũng có thể đăng kí môn này trong các học kỳ chính hoặc tham gia thực tập ở doanh nghiệp nước ngoài với thời gian 6 tháng nếu thu xếp được thời gian. Quy trình đăng ký và đánh giá cũng tương tự.

47. Thực tập tốt nghiệp (Special Study of the Field)

⁻ Mã MH: IT083IU

⁻ Số tín chỉ: 03

⁻ Điều kiện: sinh viên tích luỹ đủ 96 tín chỉ có thể làm đồ án môn học

⁻ Mô tả vắn tắt nội dung: Nội dung đồ án có thể là một đề tài nghiên cứu hoặc xây dựng một ứng dụng mới làm nền tảng cho luận văn tốt nghiệp. Các chủ đề nghiên cứu bao gồm các lĩnh vực của chương trình học thuật mang tính học thuật hoặc thực tiễn.

48. Luận văn tốt nghiệp (Thesis)

⁻ Mã MH: IT058IU

⁻ Số tín chỉ: 10

⁻ Môn học trước: Thực tập tốt nghiệp

⁻ Điều kiện: Sinh viên tích luỹ đủ 120 tín chỉ có thể làm luận văn

⁻ Mô tả vắn tắt nội dung: Luận văn là các dự án loại công nghiệp, được thiết kế để đảm bảo sinh viên đã nắm vững các môn học của mình trong chương trình. Tất cả các dự án đều dựa trên các "dự án thực tế" do ngành công nghiệp cung cấp cho sinh viên để làm việc phát triển kỹ năng và áp dụng kiến thức thu được từ tất cả các khóa học trong suốt chương trình. Sinh viên sẽ làm việc độc lập để phát triển các yêu cầu, thiết kế, thực hiện và cung cấp giải pháp cho các vấn đề kinh doanh. Sinh viên có thể theo bất kỳ mô hình quy trình thích hợp nào, phải tự quản lý dự án, theo tất cả các kỹ thuật quản lý dự án phù hợp.

Thành công của dự án được xác định phần lớn bởi việc sinh viên có giải quyết được vấn đề của khách hàng một cách đầy đủ hay không.

⁻ Sinh viên sẽ cung cấp các sản phẩm cuối cùng với tất cả các hiện vật phù hợp với mô hình quy trình đang sử dụng (ví dụ: kế hoạch dự án, yêu cầu kỹ thuật, tài liệu kiến trúc hệ thống và phần mềm, tài liệu thiết kế, kế hoạch kiểm thử, mã nguồn và các sản phẩm phần mềm cài đặt).

TRƯỞNG KHOA	**KT. HIỆU TRƯỞNG** **PHÓ HIỆU TRƯỞNG**
Nguyễn Văn Sinh	**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 I

NỘI DUNG ĐIỀU CHỈNH CHƯƠNG TRÌNH ĐÀO TẠO NGÀNH KHOA HỌC DỮ LIỆU KHÓA 2024 SO VỚI KHÓA 2023

(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2024 của Hiệu trưởng Trường Đại học Quốc tế)

1. Các môn học loại bỏ khỏi chương trình đào tạo

Không có nội dung điều chỉnh

2. Các môn học bổ sung vào chương trình đào tạo

Bổ sung thêm 02 môn học tự chọn sau:

- Human-Computer Interaction (Thiết kế giao diện và trải nghiệm người dùng) 4TC (3 LT, 1 TH)
- Web Application Development (Phát triển ứng dụng web) 4TC (3 LT, 1 TH)

3. Các điều chỉnh khác

Cập nhật theo mẫu mới cho tất cả CTĐT và đề cương chi tiết tất cả các học phần trong CTĐT

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

Không có nội dung điều chỉnh

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 II

ĐỀ CƯƠNG CHI TIẾT CÁC MÔN HỌC

(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2024 của Hiệu trưởng Trường Đại học Quốc tế)

(Sắp xếp đúng thứ tự môn học theo Hình 1 - Nội dung CTĐT)

ĐẠI HỌC QUỐC GIA TP. HỒ CHÍ MINH
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

Triết học Mác-Lênin
(Philosophy Marx – Lenin)

1. Thông tin chung

Tên môn học (tiếng Việt):	Triết học Mác-Lênin
Tên môn học (tiếng Anh):	Philosophy Marx – Lenin
Mã số môn học:	PE015IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	3
Số tiết lý thuyết:	*30 (trên lớp)*
Số tiết thực hành:	*15 (trên lớp)*
Số tiết tự học:	*90 (về nhà)*
Giảng viên phụ trách	Khoa Chính trị - Hành chính, ĐHQG-HCM

2. Mục đích/mục tiêu môn học (Course Purposes/Aims)

2.1. Môn học trang bị cho sinh viên những nội dung cơ bản về thế giới quan, phương pháp luận triết học Mác – Lênin.

2.2. Giúp cho sinh viên vận dụng những tri thức về thế giới quan, phương pháp luận triết học 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.

3. Mô tả môn học (Course Outlines)

Môn học trang bị cho sinh viên những kiến thức cơ bản về triết học Mác-Lênin

4. Tài liệu phục vụ học tập:

- Bộ Giáo dục và Đào tạo (2019), *Giáo trình Triết học Mác – Lênin*, 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 Triết học Mác-Lênin*, Nxb. Chính trị quốc gia, Hà Nội.

5. Chuẩn đầu ra môn học (Course Learning Outcomes)

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
5.1. Kiến thức					
LO.1	TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI	LO.1.1 - Khái lược được triết học, một số khái niệm cơ bản trong triết học	2.1	1.1.3	I3
		LO.1.2 – Nhận biết được sự đối lập giữa chủ nghĩa duy vật và chủ nghĩa duy tâm trong việc giải quyết vấn đề cơ bản của triết học			
		LO.1.3 – Nắm được chủ nghĩa duy vật biện chứng – hình thức phát triển cao nhất của chủ nghĩa duy vật biện chứng			
		LO.1.4 – Nắm rõ được sự ra đời, đối tượng, chức năng và vai trò của triết học Mác - Lênin			
LO.2	CHỦ NGHĨA DUY VẬT BIỆN CHỨNG	LO.2.1- Hiểu rõ vật chất theo quan điểm của chủ nghĩa duy vật biện chứng	2.1	1.1.3	T4
		LO.2.2 – Hiểu rõ ý thức theo quan điểm của chủ nghĩa duy vật biện chứng	2.1		
		LO.2.3 – Giải quyết được mối quan hệ giữa vật chất và ý thức theo quan điểm của chủ nghĩa duy vật biện chứng	2.1		
		LO.2.4 – Hiểu được phép biện chứng và phép biện chứng duy vật	2.1		

		LO.2.5 – Hiểu rõ được hai nguyên lý cơ bản của phép biện chứng duy vật và rút ra ý nghĩa phương pháp luận của từng nguyên lý	2.1 2.2		
		LO.2.6 – Hiểu rõ được các cặp phạm trù cơ bản của phép biện chứng duy vật và rút ra ý nghĩa phương pháp luận từng cặp phạm trù	2.1 2.2		
		LO.2.7 - Hiểu rõ được các quy luật cơ bản của cơ bản của phép biện chứng duy vật và rút ra ý nghĩa phương pháp luận từng quy luật	2.1 2.2	1.1.3	T4
		LO.2.8 - Hiểu rõ được thực tiễn, nhận thức, vai trò của thực tiễn đối với nhận thức và chân lý	2.1		
LO.3	CHỦ NGHĨA DUY VẬT LỊCH SỬ	LO.3.1 - Nắm được vai trò của sản xuất vật chất và phương thức sản xuất đối với sự tồn tại và phát triển xã hội	2.1 2.2	1.1.3	T4
		LO.3.2 - Hiểu rõ được mối quan hệ biện chứng giữa lực lượng sản xuất và quan hệ sản xuất			
		LO.3.3 - Hiểu rõ được mối quan hệ biện chứng giữa CSHT và KTTT; sự phát triển tự nhiên của các hình thái KT-XH			
		LO.3.4 - Hiểu rõ được giai cấp, đấu tranh giai cấp; dân tộc và mối quan hệ giữa giai cấp, dân tộc và nhân loại			
		LO.3.5 - Hiểu rõ được nhà nước và mạng xã hội			
		LO.3.6 - Hiểu rõ được mối quan hệ biện chứng giữa tồn tại xã hội và ý thức xã hội			

		LO.3.7 - Hiểu rõ được con người, bản chất con người; hiện tượng tha hóa và giải phóng con người; mối quan hệ giữa cá nhân và xã hội, vai trò của quần chúng nhân dân			
5.2. Kỹ năng					
LO.4	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.4.1. Có kỹ năng khái quát hóa để rút ra *Từ khóa tri thức* đối với mỗi nội dung và tư duy có hệ thống LO.4.2. Có kỹ năng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn LO.4.3. Có kỹ năng giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức và kinh nghiệm, khả năng điều hành nhóm làm việc	2.1 2.2	2.1.1 2.3.1 2.4.4 2.5 3.1.5	U4
5.3. Thái độ					
LO.5	THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VA SAU KHI HỌC TẬP	LO.5.1. Có ý thức trách nhiệm bảo vệ tính khoa học, cách mạng, nhân văn của CN Mác – Lênin LO.5.2. Có ý thức, trách nhiệm cá nhân đối với tập thể, cộng đồng LO.5.3. Có nhận thức về sự cần thiết học tập, nghiên cứu suốt đời và vận dụng nó trong cuộc sống.	2.1 2.2	3.1	U3

6. Kế hoạch giảng dạy theo buổi học (Course Plan):

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1 (1 tiết)	**Giới thiệu về môn học**	LO.1, LO.4;	**Dạy**: - Giới thiệu đề cương môn học - Giới thiệu nội dung đề tài thuyết trình nhóm GHW) **Học ở lớp**: - Chia nhóm (5 SV/nhóm) - Giới thiệu nhóm học tập **Học ngoài lớp**: -Chọn đề tài thuyết trình của nhóm (GHW) - Đọc trước tài liệu chương 1.	
2 (15 tiết)	**Chương 1** TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI	LO.1; LO.4 LO.5	**Dạy**: I. TRIẾT HỌC VÀ VẤN ĐỀ CƠ BẢN CỦA TRIẾT HỌC 1. Khái lược về triết học 2. Vấn đề cơ bản của triết học 3. Biện chứng và siêu hình 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 2. Đối tượng và chức năng của triết học Mác - Lênin 3. Vai trò của triết học Mác - Lênin trong đời sống xã hội và trong sự nghiệp đổi mới ở Việt Nam hiện nay **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.	Thi giữa kỳ (Quiz)
3 (15 tiết)	**Chương 2** CHỦ NGHĨA DUY VẬT BIỆN CHỨNG	LO.2 LO.4 LO.5	**Dạy**: 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 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 2. Nội dung của phép biện chứng duy	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)

			vật 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 4. Các giai đoạn cơ bản của quá trình nhận thức 5. Chân lý **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Đọc trước tài liệu chương 3	
4 (14 tiết)	**Chương 3** CHỦ NGHĨA DUY VẬT LỊCH SỬ	LO.3 LO.4 LO.5	**Dạy:** 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 2. Biện chứng giữa lực lượng sản xuất và quan hệ sản xuất 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 II. GIAI CẤP VÀ DÂN TỘC 160 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 2. Cách mạng xã hội 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 V. TRIẾT HỌC VỀ CON NGƯỜI 1. Khái niệm con người và bản chất con người 2. Hiện tượng tha hóa con người và vấn đề giải phóng con người 3. Quan hệ cá nhân và xã hội; vai trò của quần chúng nhân dân và lãnh tụ trong lịch sử 4. Vấn đề con người trong sự nghiệp	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)

			cách mạng ở Việt Nam **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Hoàn thiện bài thuyết trình	

7. Đánh giá môn học

STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	15%	Thuyết trình và bản báo cáo nhóm	LO.2 LO.3 LO.4 LO.5
2	Quiz	Bài thi giữa kỳ	Thi theo đề thi chung	20%	Tự luận đề mở	LO.1 LO.2;
3	DIC	Thảo luận, chuyên cần tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	15%	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	LO.4 LO.5
4	FEX	Thi cuối kỳ	Đề thi bao quát toàn bộ nội dung môn học	50%	Tự luận đề đóng	LO.2; LO.3; LO.4;
			Tổng cộng	**100%**		

8. Tiêu chí đánh giá chuẩn đầu ra môn học

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	Nhận biết được sự đối lập giữa chủ nghĩa duy vật và chủ nghĩa duy tâm trong việc giải quyết vấn đề cơ bản của triết học; vai trò của triết học Mác - Lênin	Chương 1	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV

LO.2 LO.4	Nắm rõ nội dung: Vật chất, ý thức và mối quan hệ giữa chúng; các nguyên lý, các quy luật và các phạm trù cơ bản của phép biện chứng duy vật	Chương 2	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của GV
LO.3 LO.4	Nhận biết và nắm được nội dung của chủ nghĩa duy vật lịch sử	Chương 3	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV

9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn

- 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 2 hoặc trực tiếp nộp cho GV buổi 1.

Tuần 4 (buổi thứ 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 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.

TP. Hồ Chí Minh, ngày 07 tháng 02 năm 2020

KT. TRƯỞNG KHOA
PHÓ TRƯỞNG KHOA

TS. Nguyễn Đình Quốc Cường

ĐẠI HỌC QUỐC GIA TP. HỒ CHÍ MINH
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

Kinh tế chính trị Mác-Lênin
(Marxist – Leninist Political Economy)

1. Thông tin chung

Tên môn học (tiếng Việt):	Kinh tế chính trị Mác-Lênin
Tên môn học (tiếng Anh):	Marxist – Leninist Political Economy
Mã số môn học:	PE016IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	2
Số tiết lý thuyết:	*20 (trên lớp)*
Số tiết thực hành:	*10 (trên lớp)*
Số tiết tự học:	*60 (về nhà)*
Môn học song hành:	1. Triết học Mác - Lênin
Giảng viên phụ trách:	Khoa Chính trị - Hành chính, ĐHQG-HCM

2. Mục đích/mục tiêu môn học (Course Purposes/Aims)

2.1. 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 lắp, 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.

2.2. Hai là, trên cơ sở đó 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 sau khi ra trường.

2.3. Ba là, góp phần xây dựng lập trường, ý thức hệ tư tưởng Mác – Lê nin đối với sinh viên.

3. Mô tả môn học (Course Outlines)

Nội dung chương trình gồm 6 chương: Trong đó chương 1 bàn về đối tượng, phương pháp nghiên cứu và chức năng của Kinh tế chính trị Mác – Lênin. Từ chương 2 đến chương 6 trình bày nội dung cốt lõi của Kinh tế chính trị Mác – Lê nin theo mục tiêu của môn học. Cụ thể các vấn đề như: Hàng hóa, thị trường và vai trò của các chủ thể trong nền kinh tế thị trường; Sản xuất giá trị thặng dư trong nền kinh tế thị trường; Cạnh tranh và độc quyền trong nền kinh tế thị trường; Kinh tế thị trường định hướng xã hội chủ nghĩa và các quan hệ lợi ích kinh tế ở Việt Nam; Công nghiệp hóa, hiện đại hóa và hội nhập kinh tế quốc tế ở Việt Nam.

4. Tài liệu phục vụ học tập:

- Tài liệu bắt buộc: Giáo trình kinh tế chính trị Mác – Lê nin dành cho bậc đại học không chuyên kinh tế chính trị.
- Tài liệu đọc thêm::

+ Robert, JR và Robert F. Hebert (2003), Lịch sử các học thuyết kinh tế, Bản tiếng Việt, Nxb Thống kê.

+ Viện Kinh tế chính trị học, Học viện Chính trị quốc gia Hồ Chí Minh (2018), Giáo trình Kinh tế chính trị Mác – Lê nin, NXB Lý luận Chính trị.

+ Các. Mác – Ph. Ăng gen: Toàn tập, tập 20, tập 23, tập 25, Nxb Chính trị quốc gia, 1994.

+ V.I.Lê nin toàn cập, tập 3, tập 27, NXB Tiến bộ Maxcơva, 1976.

+ Davig Begg, Stanley Fisher, Rudiger Dornbusch, Kinh tế học, Nhà xuất bản Giáo dục Hà Nội 1992.

+ Đảng Cộng sản Việt Nam (2016), Văn kiện Đại hội Đại biểu toàn quốc lần thứ XII, Nxb Chính trị quốc gia, Hà Nội.

+ Đảng Cộng sản Việt Nam (2016), Báo cáo tổng kết một số vấn đề lý luận – thực tiễn qua ba mươi năm đổi mới (1986 – 2016), NXB Chính trị quốc gia, Hà Nội.

+ Đảng Cộng sản Việt Nam (2017), Nghị quyết số 11-NQ/TW ngày 03/6/2017 về: "Hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa"

+ Chỉ thị số 16/CT-TTg (2017) "về việc tăng cường năng lực tiếp cận cuộc cách mạng công nghiệp lần thứ 4".

+ Jeremy Rifkin (2014), Cuộc cách mạng công nghiệp lần thứ ba, bản dịch tiếng Việt, NXB Lao động xã hội.

+ Manfred B. Steger (2011), Toàn cầu hóa, Nxb Tri thức.

+ Klaus Schwab (2015): Cách mạng công nghiệp lần thứ tư, Nxb Chính trị quốc gia – Sự thật, 2018.

5. Chuẩn đầu ra môn học (Course Learning Outcomes)

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
5.1. Kiến thức					
LO.1	ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU VÀ CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊ MÁC – LÊNIN	LO.1.1 –Nắm được sự hình thành và phát triển của Kinh tế chính trị Mác – Lênin	2.1		I3
		LO.1.2 – Xác định được đối tượng nghiên cứu của kinh tế chính trị Mác – Lênin.			
		LO.1.3 – Hiểu rõ được phương pháp nghiên cứu của kinh tế chính trị Mác – Lênin			
		LO.1.4 – Hiểu rõ các chức năng của môn học kinh tế chính trị Mác – Lênin.			
LO.2	HÀNG HÓA, THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THỂ THAM GIA THỊ TRƯỜNG.	LO.2.1- Hiểu rõ sản xuất hàng hóa và điều kiện ra đời của sản xuất hàng hóa	2.1		T4
		LO.2.2 – Hiểu rõ hàng hóa, hai thuộc tính của hàng hóa và mối quan hệ giữa hai thuộc tính			
		LO.2.3 – Hiểu rõ mối quan hệ giữa tính hai mặt của lao động sản xuất hàng hóa với hai thuộc tính của hàng hóa			
		LO.2.4 – Hiểu rõ mặt chất và lượng của giá trị hàng hóa và các nhân tố ảnh hưởng đến lượng giá trị hàng hóa			
		LO.2.5 – Hiểu rõ được nguồn gốc, bản chất và chức năng của tiền tệ.			
		LO.2.6 – Hiểu rõ về thị trường, vai trò của thị trường, cơ chế thị trường và nền kinh tế thị trường.			

		LO.2.7 - Hiểu rõ được một số quy luật kinh tế chủ yếu của kinh tế thị trường.			
		LO.2.8 - Hiểu rõ vai trò của các chủ thể tham gia thị trường.			
LO.3	GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.3.1 – Hiểu rõ được tư bản là gì, công thức chung của tư bản và mâu thuẫn công thức chung của tư bản.	2.1		T4
		LO.3.2 - Hiểu rõ được hàng hóa sức lao động là gì, tại sao nghiên cứu hàng hóa sức lao động giải quyết mâu thuẫn công thức chung của tư bản	2.1		
		LO.3.3 - Hiểu rõ được giá trị thặng dư là gì. Xác định được có mấy phương pháp sản xuất giá trị thặng dư.	2.1 2.3		
		LO.3.4 - Hiểu rõ được bản chất của tích lũy tư bản, nhưng nhân tố làm tăng quy mô tích lũy tư bản và hệ quả của tích lũy tư bản.	2.3		
		LO.3.5 - Hiểu rõ được các khái niệm: chi phí sản xuất, lợi nhuận, tỷ suất lợi nhuận, lợi nhuận bình quân, lợi nhuận thương nghiệp, các nhân tố ảnh hưởng đến tỷ suất lợi nhuận.	2.1		
		LO.3.6 - Hiểu rõ được lợi tức là gì.	2.1		
		LO.3.7 - Hiểu rõ được địa tô tư bản chủ nghĩa. Có mấy loại địa tô tư bản chủ nghĩa và giá cả ruộng đất.	2.1 2.3		
		LO.4.1 – Hiểu rõ được quan hệ giữa cạnh tranh và độc quyền trong nền kinh tế thị trường.	2.1		

LO.4	CẠNH TRANH VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.4.2 - Hiểu rõ được nguyên nhân hình thành độc quyền trong nền kinh tế thị trường.	2.1.		T3
		LO.4.3 - Hiểu rõ được những đặc điểm kinh tế cơ bản của độc quyền trong chủ nghĩa tư bản theo quan điểm của V.I. Lênin	2.1		
		LO.4.4 - Hiểu rõ được nguyên nhân hình thành và phát triển của chủ nghĩa tư bản độc quyền nhà nước.	2.1		
		LO.4.5 - Hiểu rõ được bản chất của chủ nghĩa tư bản độc quyền nhà nước và những biểu hiện chủ yếu của độc quyền nhà nước trong chủ nghĩa tư bản.	2.3		
		LO.4.6 – Nắm được vai trò lịch sử của chủ nghĩa tư bản.	2.1		
LO.5	KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM	LO.5.1 – Hiểu rõ được khái niệm kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam	2.1		T4
		LO.5.2 - Hiểu rõ được tính tất yếu khách quan của việc phát triển kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam	2.1		
		LO.5.3 – Nắm được những đặc trưng của kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam.	2.1		
		LO.5.4 – Hiểu rõ thể chế kinh tế thị trường định hướng xã hội chủ nghĩa là gì và sự cần thiết phải hoàn thiện nó.	2.1		
		LO.5.5 – Nắm được những nội dung cơ bản của hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam	2.1		
		LO.5.6 – Hiểu rõ được khái niệm lợi ích kinh tế và quan hệ lợi ích kinh tế	2.2		
		LO.5.7 –Hiểu rõ được vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích	2.1		
		LO.6.1 – Hiểu rõ được cách mạng công nghiệp là gì, khái quát được các cuộc cách mạng đã diễn ra trong lịch sử.	2.1		T4
		LO.6.2 - Hiểu rõ vai trò của cách mạng công nghiệp đối với sự phát	2.1		

LO.6	CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA VÀ HỘI NHẬP KINH TẾ QUỐC TẾ CỦA VIỆT NAM	triển.			
		LO.6.3 – Hiểu được công nghiệp hóa là gì và các mô hình công nghiệp hóa tiêu biểu trên thế giới.	2.1		
		LO.6.4 – Hiểu rõ tính tất yếu khách quan của công nghiệp hóa, hiện đại hóa ở Việt Nam.	2.1		
		LO.6.5 – Nắm được những nội dung của công nghiệp hóa, hiện đại hóa ở Việt Nam.	2.1		
		LO.6.6 – Nắm được công nghiệp hóa, hiện đại hóa ở Việt Nam trong bối cảnh của cuộc cách mạng công nghiệp lần thứ 4.	2.3		
		LO.6.7 – Hiểu rõ được hội nhập kinh tế quốc tế là gì. Vì sao hội nhập kinh tế quốc tế là sự cần thiết khách quan.	2.1		
		LO.6.8 – Nắm được những nội dung và tác động tích cực và tiêu cực của hội nhập kinh tế quốc tế.	2.3		
		LO.6.9 – Nắm được phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế trong phát triển của Việt Nam	2.3		
5.2. Kỹ năng					
LO.7	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.7.1. Có kỹ năng khái quát hóa để rút ra *Từ khóa tri thức* đối với mỗi nội dung và tư duy có hệ thống LO.7.2. Có kỹ năng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn LO.7.3. Có kỹ năng giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức và kinh nghiệm, khả năng điều hành nhóm làm việc	2.1 2.2 2.4		U4
5.3. Thái độ					
LO.8	THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	LO.8.1. Có ý thức trách nhiệm bảo vệ tính khoa học, cách mạng, nhân văn của CN Mác – Lênin LO.8.2. Có ý thức, trách nhiệm cá nhân đối với tập thể, cộng đồng LO.8.3. Có nhận thức về sự cần thiết học tập, nghiên cứu suốt đời và vận	2.1 2.2 2.3		U3

		dụng nó trong cuộc sống.			

6. Kế hoạch giảng dạy theo buổi học (Course Plan):

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1 (1 tiết)	Giới thiệu về môn học	LO.1, LO.7;	**Dạy**: - Tự giới thiệu về giảng viên - Giới thiệu đề cương và tài liệu môn học - Hướng dẫn cách thức dạy và học và cách đánh giá. - Giới thiệu nội dung đề tài thuyết trình nhóm GHW) **Học ở lớp**: - Chia nhóm (5 SV/nhóm) - Giới thiệu nhóm học tập **Học ngoài lớp**: -Chọn đề tài thuyết trình của nhóm (GHW) - Đọc trước tài liệu chương 1.	
2 (2 tiết)	**Chương 1** ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU VÀ CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊ MÁC – LÊNIN	LO.1; LO.7 LO.8	**Dạy**: I. SỰ HÌNH THÀNH VÀ PHÁT TRIỂN CỦA KTCT MÁC – LÊNIN 1. Giai đoạn từ cổ đại đến thế kỷ 18 2. Giai đoạn từ sau thế kỷ 18 đến nay II. ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU CỦA KINH TẾ CHÍNH TRỊ MÁC – LÊNIN. 1. Đối tượng nghiên cứu 2. Phương pháp nghiên cứu 3. Mục đích nghiên cứu III. CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊ MÁC – LÊNIN. 1. Chức năng nhận thức 2. Chức năng thực tiễn 3. Chức năng tư tưởng 4. Chức năng phương pháp luận **Học ở lớp**: Thảo luận và phát biểu trên lớp. **Học ngoài lớp**: - Phác thảo nội dung thuyết trình nhóm	Thi giữa kỳ (Quiz)

			GHW - Đọc trước tài liệu chương 2.	
3 (6 tiết)	**Chương 2** HÀNG HÓA, THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THỂ THAM GIA THỊ TRƯỜNG.	LO.2 LO.7 LO.8	**Dạy**: I. LÝ LUẬN CỦA CÁC MÁC VỀ SẢN XUẤT HÀNG HÓA VÀ HÀNG HÓA. 1. Sản xuất hàng hóa -Khái niệm sản xuất hàng hóa - Điều kiện ra đời của sản xuất hàng hóa. 2. Hàng hóa - Khái niệm hàng hóa - Hai thuộc tính của hàng hóa - Lượng giá trị và các nhân tố ảnh hưởng đến lượng giá trị của hàng hóa - Tính hai mặt của lao động sản xuất hàng hóa. 3. Tiền - Nguồn gốc và bản chất của tiền - Chức năng của tiền 4. Dịch vụ và một số hàng hóa đặc biệt. II. THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THỂ THAM GIA THỊ TRƯỜNG. 1. Thị trường - Khái niệm về thị trường - Vai trò của thị trường. - Cơ chế thị trường - Nền kinh tế thị trường. 2. Vai trò của các chủ thể tham gia thị trường. - Người sản xuất. - Người tiêu dùng. - Các chủ thể trung gian trong thị trường. - Nhà nước. **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Đọc trước tài liệu chương 3	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)
4 (6 tiết)	**Chương 3** GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.3 LO.7 LO.8	**Dạy**: I. LÝ LUẬN CỦA CÁC MÁC VỀ GIÁ TRỊ THẶNG DƯ. 1. Nguồn gốc của giá trị thặng dư 2. Bản chất của giá trị thặng dư 3. Các phương pháp sản xuất giá trị thặng dư trong nền kinh tế thị trường tư bản chủ nghĩa. II. TÍCH LŨY TƯ BẢN. - Bản chất của tích lũy tư bản - Những nhân tố góp phần làm tăng quy mô tích lũy.	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)

			- Một số hệ quả của tích lũy tư bản. III. CÁC HÌNH THỨC BIỂU HIỆN GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG. 1. Lợi nhuận 2. Lợi tức 3. Địa tô tư bản chủ nghĩa **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Hoàn thiện bài thuyết trình Đọc trước tài liệu chương 4	
5 (5 tiết)	**Chương 4** CẠNH TRANH VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.4 LO.7 LO.8	**Dạy**: I. QUAN HỆ GIỮA CẠNH TRANH VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG. II. ĐỘC QUYỀN VÀ ĐỘC QUYỀN NHÀ NƯỚC TRONG NỀN KINH TẾ THỊ TRƯỜNG. 1. Lý luận của V.I. Lênin về độc quyền trong nền kinh tế thị trường. - Nguyên nhân hình thành và tác động của độc quyền. - Những đặc điểm kinh tế cơ bản của độc quyền trong chủ nghĩa tư bản 2. Lý luận của V.I. Lê nin về độc quyền nhà nước trong chủ nghĩa tư bản. - Nguyên nhân ra đời và phát triển của độc quyền nhà nước trong chủ nghĩa tư bản. - Bản chất của độc quyền nhà nước trong chủ nghĩa tư bản.. - Những biểu hiện chủ yếu của độc quyền nhà nước trong chủ nghĩa tư bản. - Vai trò lịch sử của chủ nghĩa tư bản. **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Đọc trước tài liệu chương 5	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)
6 (5 tiết)	**Chương 5** KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM	LO.5 LO.7 LO.8	**Dạy**: I. KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM 1. Khái niệm kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam 2. Tính tất yếu khách quan của việc phát triển kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam. 3. Đặc trưng của kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam. II. HOÀN THIỆN THỂ CHẾ KINH TẾ	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)

			THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM. 1. Sự cần thiết phải hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam 2. Hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam một số khía cạnh chủ yếu. III. CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM. 1. Lợi ích kinh tế và quan hệ lợi ích kinh tế. 2.Vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Hoàn thiện bài thuyết trình Đọc trước tài liệu chương 6	
7 (5 tiết)	**Chương 6** CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA VÀ HỘI NHẬP KINH TẾ QUỐC TẾ CỦA VIỆT NAM	LO.6 LO.7 LO.8	**Dạy**: I. CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA Ở VIỆT NAM. 1. Khái quát 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 2. Tính tất yếu khách quan và nội dung của công nghiệp hóa, hiện đại hóa ở Việt Nam. - Tính tất yếu của công nghiệp hóa, hiện đại hóa ở Việt Nam. - Nội dung công nghiệp hóa, hiện đại hóa ở Việt Nam. 3. Công nghiệp hóa, hiện đại hóa ở Việt Nam trong bối cảnh cách mạng công nghiệp lần thứ 4. II. HỘI NHẬP KINH TẾ QUỐC TẾ CỦA VIỆT NAM. 1. Khái niệm và các hình thức hội nhập kinh tế quốc tế. - Khái niệm và sự cần thiết khách quan của hội nhập kinh tế quốc tế. - Những nội dung của hội nhập kinh tế quốc tế 2. Tác động của hội nhập kinh tế quốc tế đến phát triển của Việt Nam. - Tác động tích cực. - Tác động tiêu cực 3. Phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế trong phát triển của Việt Nam	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)

			Học ở lớp: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Hoàn thiện bài thuyết trình.	

7. Đánh giá môn học

STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	15%	Thuyết trình và bản báo cáo nhóm	LO.4 LO.5 LO6 LO.7 LO.8
2	Quiz	Bài thi giữa kỳ	Thi theo đề thi chung	20%	Tự luận đề mở	LO.2 LO.3
3	DIC	Thảo luận, chuyên cần tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	15%	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	LO.7 LO.8
4	FEX	Thi cuối kỳ	Đề thi bao quát toàn bộ nội dung môn học	50%	Tự luận đề đóng	LO.2 LO.3 LO.4 LO.5 LO.6 LO.7 LO.8
			Tổng cộng	**100%**		

8. Tiêu chí đánh giá chuẩn đầu ra môn học

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá

LO.1	Nhận biết được vị trí của Kinh tế chính trị Mác – Lênin trong hệ thống lịch sử tư tưởng kinh tế và nắm được đối tượng, phương pháp và chức năng của kinh tế chính trị Mác – Lênin.	Chương 1	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.2 LO.7	Nắm rõ nội dung: sản xuất hàng hóa, điều kiện ra đời của sản xuất hàng hóa, khái niệm hàng hóa và hai thuộc tính của hàng hóa, chất và lượng của giá trị hàng hóa, mối quan hệ giữa tính hai mặt của lao động sản xuất hàng hóa với hai thuộc tính của hàng hóa, các nhân tố ảnh hưởng đến lượng giá trị của hàng hóa, nguồn gốc ra đời, bản chất và chức năng của tiền. Thị trường, cơ chế thị trường, nền kinh tế thị trường và vai trò các chủ thể tham gia thị trường	Chương 2	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của GV
LO.3 LO.7	Hiểu rõ và nắm được những nội dung: tư bản là gì?. Công thức chung và mâu thuẫn công thức chung của tư bản. Hàng hóa sức lao động và tính chất đặc biệt của giá trị sử dụng hàng hóa sức lao động. Giá trị thặng dư và hai phương pháp sản xuất giá trị thặng dư. Tích lũy tư bản và những nhân tố làm tăng quy mô tích lũy. Các khái niệm về chi phí sản xuất, lợi nhuận, lợi tức và địa tô tư bản chủ nghĩa	Chương 3	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV
LO.4 LO.7	Hiểu rõ và nắm được những nội dung: quan hệ giữa cạnh tranh và độc quyền trong nền kinh tế thị trường. Tổ chức độc quyền là gì?, nguyên nhân hình thành các tổ chức độc quyền. Những đặc điểm kinh tế cơ bản của độc quyền theo quan điểm của V.I. Lênin. Lý luận về độc quyền nhà nước trong chủ nghĩa tư bản. Vai trò lịch sử	Chương 4	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV

	của chủ nghĩa tư bản.			
LO.5 LO.7	Hiểu rõ và nắm được những nội dung: kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam, những đặc trưng của kinh tế thị trường định hướng xã hội chủ nghĩa. Thể chế kinh tế thị trường định hướng xã hội chủ nghĩa và sự cần thiết phải hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa. Lợi ích kinh tế và quan hệ lợi ích kinh tế. Vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích.	Chương 5	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV
LO.6 LO.7	Hiểu rõ và nắm được những nội dung: cách mạng công nghiệp là gì? Vai trò của cách mạng công nghiệp đối với sự phát triển. Công nghiệp hóa là gì?. Các mô hình công nghiệp hóa tiêu biểu trên thế giới. Công nghiệp hóa, hiện đại hóa ở Việt Nam là gì. Tính tất yếu khách quan phải công nghiệp hóa, hiện đại hóa ở Việt Nam. Công nghiệp hóa, hiện đại hóa ở Việt Nam trong bối cảnh cuộc cách mạng công nghiệp lần thứ 4. Hội nhập kinh tế quốc tế là gì, sự cần thiết khách quan phải hội nhập kinh tế quốc tế. Tác động của hội nhập kinh tế quốc tế của Việt Nam. Phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế.	Chương 6	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV

9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với giảng viên qua email: lethong0804@gmail.com

- 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 2 hoặc trực tiếp nộp cho GV buổi 1.

Tuần 4 (buổi thứ 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 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.

TP. Hồ Chí Minh, ngày 07 tháng 02 năm 2020

KT. TRƯỞNG KHOA
PHÓ TRƯỞNG KHOA

TS. Nguyễn Đình Quốc Cường

ĐẠI HỌC QUỐC GIA TP. HỒ CHÍ MINH
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

Chủ nghĩa xã hội khoa học
(Scientific socialism)

1. Thông tin chung

Tên môn học (tiếng Việt):	Chủ nghĩa xã hội khoa học
Tên môn học (tiếng Anh):	Scientific socialism
Mã số môn học:	PE017IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	2
Số tiết lý thuyết:	*30 (trên lớp)*
Số tiết thực hành:	
Số tiết tự học:	*6 0 (về nhà)*
Môn học trước:	1. Kinh tế chính trị Mác – Lênin, 2. Triết học Mác - Lênin
Giảng viên phụ trách	Khoa Chính trị - Hành chính, ĐHQG-HCM

2. Mục đích/mục tiêu môn học (Course Purposes/Aims)

2.1. 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).

2.2. 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.

3. Mô tả môn học (Course Outlines)

Môn học trang bị cho sinh viên những kiến thức cơ bản về chủ nghĩa xã hội khoa học

4. Tài liệu phục vụ học tập:

- Bộ Giáo dục và Đào tạo (2019), *Giáo trình Chủ nghĩa xã hội khoa học*, Nxb. Chính trị quốc gia, Hà Nội.

- Bộ Giáo dục và Đào tạo (2012), *Giáo trình Những Nguyên lý cơ bản của chủ*

- 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.

5. Chuẩn đầu ra môn học (Course Learning Outcomes)

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
5.1. Kiến thức					
LO.1	NHẬP MÔN CHỦ NGHĨA XÃ HỘI KHOA HỌC	LO.1.1 - Khái lược sự ra đời Chủ nghĩa xã hội khoa học, hoàn cảnh lịch sử và vai trò của Các Mác và Ph. Ăngghen,	2.1	1.1.3	I3
		LO.1.2 – Nhận biết được các giai đoạn phát triển cơ bản của Chủ nghĩa xã hội khoa học thể hiện qua các tác phẩm tiêu biểu từ giai đoạn C. Mác đến giai đoạn Lênin và sau Lênin			
		LO.1.3 – Nắm rõ được đối tượng, phương pháp và ý nghĩa của việc nghiên cứu Chủ nghĩa xã hội khoa học			
LO.2	SỨ MỆNH LỊCH SỬ CỦA GIAI CẤP CÔNG NHÂN	LO.2.1- Hiểu rõ khái niệm giai cấp công nhân và đặc điểm của giai cấp công nhân	2.1	1.1.3	T4
		LO.2.2 – Nắm rõ nội dung, đặc điểm sứ mệnh lịch sử của giai cấp công nhân	2.1		
		LO.2.3 – Giải thích được những điều kiện quy định sứ mệnh lịch sử của giai cấp công nhân	2.1		
		LO.2.4 – Phân tích được những điểm tương đồng và khác biệt của giai cấp công nhân hiện nay và việc thực hiện sứ mệnh của giai cấp công nhân trên thế giới hiện nay	2.1 2.1		
		LO.2.5 – Nắm rõ những đặc điểm cơ bản của giai cấp công nhân Việt Nam và nội dung sứ mệnh	2.2		

		lịch sử của giai cấp công nhân Việt Nam hiện nay	2.1 2.2		
		LO.2.6 – Trình bày được phương hướng và một số giải pháp chủ yếu để xây dựng giai cấp công nhân Việt Nam hiện nay.			
LO.3	CHỦ NGHĨA XÃ HỘI VÀ THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.3.1 - Hiểu rõ Chủ nghĩa xã hội là giai đoạn đầu của hình thái kinh tế - xã hội cộng sản chủ nghĩa	2.1	1.1.3	I3
		LO.3.2 – Trình bày được những đặc trưng cơ bản của chủ nghĩa xã hội			
		LO.3.3 – Giải thích được tính tất yếu khách quan của thời kỳ quá độ lên chủ nghĩa xã hội và những đặc điểm cơ bản của thời kỳ quá độ lên chủ nghĩa xã hội			
		LO.3.4 – Hiểu rõ đặc trưng của thời kỳ quá độ và chủ nghĩa xã hội ở Việt Nam, trình bày được những phương hướng xây dựng chủ nghĩa xã hội ở Việt Nam hiện nay			
LO.4	DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA	LO.4.1 – Giải thích được quan niệm về dân chủ và sự ra đời và phát triển của dân chủ trong lịch sử xã hội loài người	2.1	1.1.3	T4
		LO.4.2 – Nắm rõ quá trình ra đời và bản chất của nền dân chủ xã hội chủ nghĩa	2.1		
		LO.4.3 – Hiểu được sự ra đời, bản chất và chức năng của nhà nước xã hội chủ nghĩa cũng như mối quan hệ giữa dân chủ và nhà nước	2.1		
		LO.4.4 – Hiểu được sự ra đời, phát triển và bản chất của nền dân chủ xã hội chủ nghãi ở Việt Nam	2.1 2.2		
		LO.4.5 – Trình bày được đặc điểm và các giải pháp cơ bản			

		nhằm xây dựng nhà nước pháp quyền xã hội chủ nghĩa ở Việt Nam hiện nay			
LO.5	CƠ CẤU XÃ HỘI GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.5.1 - Trình bày được khái niệm cơ cấu xã hội - giai cấp và sự biến đổi của cơ cấu xã hội giai cấp trong thời kỳ quá độ lên chủ nghĩa xã hội LO.5.2 – Giải thích được tính tất yếu và nội dung của liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội LO.5.3 – Hiểu rõ cơ cấu xã hội - giai cấp ở Việt Nam trong thời kỳ quá độ và trình bày được những giải pháp cơ bản nhằm xây dựng, phát triển khối liên minh giai cấp, tầng lớp xã hội ở Việt Nam hiện nay	2.1	1.1.3	I3
LO.6	VẤN ĐỀ DÂN TỘC VÀ TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.6.1- Hiểu rõ khái niệm, đặc trưng cơ bản của dân tộc và quan điểm của chủ nghĩa Mác - Leenin về vấn đề dân tộc LO.6.2 – Trình bày được những đặc điểm cơ bản của dân tộc ở Việt Nam và quan điểm chính sách dân tộc của Đảng và Nhà nước Việt Nam LO.6.3 – Hiểu được bản chất, nguồn gốc, tính chất của tôn giáo và nguyên tắc cơ bản giải quyết vấn đề tôn giáo trong thời kỳ quá độ lên chủ nghĩa xã hội LO.6.4 – Giải thích được những đặc điểm tôn giáo ở Việt Nam và chính sách của Đảng và Nhà nước Việt Nam đối với tín ngưỡng tôn	2.1 2.1 2.1 2.1 2.1 2.2	1.1.3	T4

		giáo hiện nay	2.1 2.2		
		LO.6.5 – Hiểu rõ được đặc điểm quan hệ dân tộc và tôn giáo ở Việt Nam và trình bày được các định hướng cơ bản nhằm giải quyết mối quan hệ giữa dân tộc và tôn giáo ở Việt Nam hiện nay			
LO.7	VẤN ĐỀ GIA ĐÌNH TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.7.1 - Khái lược được vị trí, chức năng và vai trò của gia đình trong xã hội	2.1	1.1.3	I3
		LO.7.2 – Nhận biết được các cơ sở xây dựng gia đình trong thời kỳ quá độ lên chủ nghĩa xã hội			
		LO.1.3 – Giải thích được sự biến đổi của gia đình Việt Nam trong thời kỳ quá độ và trình bày được những phương hướng cơ bản xây dựng và phát triển gia đình Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội			
5.2. Kỹ năng					
LO.8	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.8.1. Có kỹ năng khái quát hóa để rút ra *Từ khóa tri thức* đối với mỗi nội dung và tư duy có hệ thống	2.1 2.2	2.1.1 2.3.1	U4
		LO.8.2. Có kỹ năng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn		2.4.4	
		LO.8.3. Có kỹ năng giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức và kinh nghiệm, khả năng điều hành nhóm làm việc		2.5 3.1.5	

5.3. Thái độ					
LO.9	THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VA SAU KHI HỌC TẬP	LO.9.1. Có ý thức trách nhiệm bảo vệ tính khoa học, cách mạng trong lý luận của chủ nghĩa Mác – Lênin về CNXH và con đường đi lên CNXH ở Việt Nam. LO.9.2. Có ý thức, trách nhiệm cá nhân đối với tập thể, cộng đồng. LO.9.3. Có nhận thức về sự cần thiết học tập, nghiên cứu suốt đời và vận dụng nó trong cuộc sống.	2.1 2.2	3.1	U3

6. Kế hoạch giảng dạy theo buổi học (Course Plan):

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1 (1 tiết)	**Giới thiệu về môn học**	LO.1, LO.4;	**Dạy**: - Giới thiệu đề cương môn học - Giới thiệu nội dung đề tài thuyết trình nhóm GHW) **Học ở lớp**: - Chia nhóm (5 SV/nhóm) - Giới thiệu nhóm học tập **Học ngoài lớp**: -Chọn đề tài thuyết trình của nhóm (GHW) - Đọc trước tài liệu chương 1.	
2	**Chương 1** NHẬP MÔN CHỦ NGHĨA XÃ HỘI KHOA HỌC	LO.1; LO.4 LO.5	**Dạy**: 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 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	Thi giữa kỳ (Quiz)

			nghĩa xã hội khoa học 3.2. Phương pháp nghiên cứu của chủ nghĩa xã hội khoa học 3.3. Ý nghĩa của việc nghiên cứu chủ nghĩa xã hội khoa học **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.	
3	**Chương 2** SỨ MỆNH LỊCH SỬ CỦA GIAI CẤP CÔNG NHÂN	LO.2 LO.4 LO.5	**Dạy**: 1. QUAN ĐIỂM CƠ BẢN CỦA CHỦ NGHĨA MÁC - LEENIN 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 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 **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Đọc trước tài liệu chương 3	Thi giữa kỳ (Quiz)
4	**Chương 3** CHỦ NGHĨA XÃ HỘI VÀ THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.3 LO.4 LO.5	**Dạy**: 1. CHỦ NGHĨA XÃ HỘI 1.1. Chủ nghĩa xã hội, giai đoạn đầu của hình thái kinh tế - xã hội cộng sản chủ nghĩa 1.2. Điều kiện ra đời chủ nghĩa xã hội 1.3. Những đặt trưng cơ bản của chủ	Thuyết trình nhóm (GHW) Thi giữa

			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 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 **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Đọc trước tài liệu chương 4	kỳ (Quiz)
5	**Chương 4** DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA	LO.2 LO.4 LO.5	**Dạy**: 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 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 **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Đọc trước tài liệu chương 5	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)
6	**Chương 5** CƠ CẤU XÃ HỘI - GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ	LO.3 LO.4 LO.5	**Dạy**: 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	Thuyết trình nhóm (GHW)

	ĐỘ LÊN CHỦ NGHĨA XÃ HỘI		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 3. CƠ CẤU XÃ HỘI - GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP 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 **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Đọc trước tài liệu chương 6	Thi cuối kỳ (FEX)
7	**Chương 6** VẤN ĐỀ DÂN TỘC VÀ TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.2 LO.4 LO.5	**Dạy**: 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 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 3.3. Phương hướng và một số giải pháp chủ yếu để xây dựng giai cấp công nhân Việt Nam hiện nay **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Đọc trước tài liệu chương 7	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)
8	**Chương 7**	LO.2	**Dạy**:	Thuyết

	VẤN ĐỀ GIA ĐÌNH TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.4 LO.5	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 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 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 **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Hoàn thiện bài thuyết trình	trình nhóm (GHW) Thi cuối kỳ (FEX)

7. Đánh giá môn học

STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	15%	Thuyết trình và bản báo cáo nhóm	LO.3 LO.4 LO.5 LO.6 LO.7
2	Quiz	Bài thi giữa kỳ	Thi theo đề thi của GV	20%	Tự luận đề mở	LO.1 LO.2 LO.3
3	DIC	Thảo luận, chuyên cần tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	15%	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	LO.3 LO.4 LO.5 LO.6 LO.7
4	FEX	Thi cuối kỳ	Đề thi bao quát toàn bộ nội dung môn học	50%	Tự luận đề đóng	LO.3 LO.4 LO.5 LO.6 LO.7

			Tổng cộng	**100%**		

8. Tiêu chí đánh giá chuẩn đầu ra môn học

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	Nhận biết quá trình ra đời của Chủ nghĩa xã hội khoa học và các giai đoạn phát triển cơ bản	Chương 1	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.2 LO.4	Nắm rõ nội dung: quan điểm cơ bản của chủ nghĩa Mác - Lênin về giai cấp công nhân, nội dung, biểu hiện và ý nghĩa của sứ mệnh đó trong bối cảnh hiện nay	Chương 2	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.3 LO.4	Nhận biết và nắm được những quan điểm cơ bản của chủ nghĩa Mác - lênin về chủ nghĩa xã hội, thời kỳ quá độ lên chủ nghĩa xã hội và sự vận dụng sáng tạo của Đảng Cộng sản Việt Nam vào điều kiện cụ thể của Việt Nam	Chương 3	Thảo luận tại lớp (Discussion in Class) Thi giữa kỳ (Quiz)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV
LO.3 LO.4	Nhận biết và nắm được bản chất của nền dân chủ xã hội chủ nghĩa và nhà nước xã hội chủ nghĩa nói chung và ở Việt Nam nói riêng	Chương 4	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của Khoa
LO.3 LO.4	Nhận biết và nắm được những kiến thức nền tảng về cơ cấu xã hội - giai cấp và liên minh giai cấp, tầng lớp trong thời kỳ quá	Chương 5	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp

	độ lên chủ nghĩa xã hội			Ngân hàng đề thi của Khoa
LO.3 LO.4	Nhận biết và nắm được những quan điểm cơ bản của chủ nghĩa Mác - Lênin về dân tộc, tôn giáo, mối quan hệ giữa dân tộc và tôn giáo, tầm quan trọng của vấn đề dân tộc, tôn giáo và nội dung chính sách dân tộc, tôn giáo của Đảng và Nhà nước Việt Nam	Chương 6	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của Khoa
LO.3 LO.4	Nhận biết và nắm được 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 hiện nay.	Chương 7	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của Khoa

9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn
- 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 2 hoặc trực tiếp nộp cho GV buổi 1.

  Giảng dạy kết thúc chương 3, các nhóm 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.

TP. Hồ Chí Minh, ngày 07 tháng 02 năm 2019

KT. TRƯỞNG KHOA
PHÓ TRƯỞNG KHOA

TS. Nguyễn Đình Quốc Cường

ĐẠI HỌC QUỐC GIA TP. HỒ CHÍ MINH
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

Lịch sử Đảng Cộng sản Việt Nam
(History of Vietnamese communist party)

1. Thông tin chung

Tên môn học (tiếng Việt):	Lịch sử Đảng Cộng sản Việt Nam
Tên môn học (tiếng Anh):	History of Vietnamese communist party
Mã số môn học:	PE018IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	2
Số tiết lý thuyết:	*20 (trên lớp)*
Số tiết thực hành:	*10 (trên lớp)*
Số tiết tự học:	*90 (về nhà)*
Môn học trước:	1. Triết học Mác – Lênin, 2. Kinh tế chính trị Mác – Lênin, 3. Chủ nghĩa xã hội khoa học
Giảng viên phụ trách	Khoa Chính trị - Hành chính, ĐHQG-HCM

2. Mục đích/mục tiêu môn học (Course Purposes/Aims)

2.1. 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 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).

2.2. 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.

2.3. 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 vào công tác thực tiễn, phê phán quan niệm sai trái về lịch sử của Đảng.

3. Mô tả môn học (Course Outlines)

Môn học trang bị cho sinh viên những kiến thức cơ bản về Lịch sử Đảng Cộng sản Việt Nam

4. Tài liệu phục vụ học tập:

- Bộ Giáo dục và Đào tạo (2019), *Chương trình môn học Lịch sử Đảng Cộng sản Việt Nam,* ban hành 2019.

- Hội đồng Trung ương chỉ đạo biên soạn giáo trình quốc gia các môn khoa học Mác – Lênin, Tư tưởng Hồ Chí Minh (2018), *Giáo trình Lịch sử Đảng Cộng sản Việt Nam (tái bản có sửa chữa, bổ sung)*, Nxb. Chính trị quốc gia, Hà Nội.

5. Chuẩn đầu ra môn học (Course Learning Outcomes)

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
5.1. Kiến thức					
LO.1	NHẬP MÔN ĐỐI TƯỢNG, CHỨC NĂNG, NHIỆM VỤ, NỘI DUNG VÀ PHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM	LO.1.1 – Nắm rõ được đối tượng, mục đích học tập, nghiên cứu và một số yêu cầu cơ bản về phương pháp học tập, nghiên cứu Lịch sử Đảng Cộng sản Việt Nam	2.1	1.1.3	I3
LO.2	ĐẢNG CỘNG SẢN VIỆT NAM RA ĐỜI VÀ LÃNH ĐẠO ĐẤU TRANH GIÀNH CHÍNH QUYỀN (1930-1945)	LO.2.1 – Nắm được bối cảnh lịch sử tác động đến sự ra đời của Đảng Cộng sản Việt Nam	2.1	1.1.3	T4
		LO.2.2 – Nắm được quá trình chuẩn bị các điều kiện để thành lập Đảng của Nguyễn Ái Quốc	2.1		

		LO.2.3- Nắm được nội dung hội nghị thành lập Đảng và Cương lĩnh chính trị đầu tiên của Đảng	2.1		
		LO.2.4 – Hiểu được ý nghĩa lịch sử của việc thành lập Đảng Cộng sản Việt Nam	2.1		
		LO.2.5 – Nắm rõ các phong trào cách mạng 1930-1935 và các chủ trương khôi phục phong trào năm 1932-1935	2.1		
		LO.2.6 – Nắm rõ phong trào dân chủ năm 1936-1939			
		LO.2.7 – Nắm rõ phong trào giải phóng dân tộc 1939-1945	2.1		
		LO.2.8 – Hiểu rõ tính chất, ý nghĩa và kinh nghiệm của Cách mạng Tháng Tám năm 1945	2.1		
LO.3	ĐẢNG LÃNH ĐẠO HAI CUỘC KHÁNG CHIẾN, HOÀN THÀNH GIẢI PHÓNG DÂN TỘC, THỐNG NHẤT ĐẤT NƯỚC (1945-1975)	LO.3.1 – Hiểu được chủ trương xây dựng và bảo vệ chính quyền cách mạng 1945-1946	2.1		
		LO.3.2 – Hiểu rõ Đường lối kháng chiến toàn quốc chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946-1950	2.1	1.1.3	T4
		LO.3.3 – Hiểu rõ chủ trương Đẩy mạnh cuộc kháng chiến chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946 đến năm 1950	2.1	1.1.3	T4
		LO.3.4 - Hiểu rõ được Ý nghĩa lịch sử và kinh nghiệm của Đảng trong lãnh đạo kháng chiến chống thực dân Pháp và can thiệp Mỹ			

		LO.3.5 – Nắm được quá trình lãnh đạo cách mạng hai miền giai đoạn 1954-1965 của Đảng			
		LO.3.6 – Nắm vững sự lãnh đạo cách mạng cả nước giai đoạn 1965-1975 của Đảng	2.1		
		LO.3.7 – Hiểu rõ Ý nghĩa và kinh nghiệm lãnh đạo của Đảng trong cuộc kháng chiến chống Mỹ, cứu nước 1954-1975			
LO.4	ĐẢNG LÃNH ĐẠO CẢ NƯỚC QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI VÀ TIẾN HÀNH CÔNG CUỘC ĐỔI MỚI (1975-2018)	LO.4.1 – Hiểu rõ chủ trương xây dựng chủ nghĩa xã hội và bảo vệ Tổ quốc 1975-1981			
		LO.4.2 – Nắm rõ nội dung Đại hội đại biểu toàn quốc lần thứ V của Đảng và các bước đột phá tiếp tục đổi mới kinh tế 1982-1986	2.1 2.2	1.1.3	T4
		LO.4.3 – Nắm rõ quan điểm Đổi mới toàn diện, đưa đất nước ra khỏi khủng hoảng kinh tế - xã hội 1986-1996 của Đảng			
		LO.4.4 – Nắm rõ thành tựu, kinh nghiệm của công cuộc đổi mới			
		LO.4.5 - Hiểu rõ những thắng lợi vĩ đại của cách mạng Việt Nam dưới sự lãnh đạo của Đảng từ năm 1930 đến 2018	2.1 2.2		
		LO.4.6 - Hiểu rõ những bài học lớn về sự lãnh đạo của Đảng từ năm 1930 đến 2018			
5.2. Kỹ năng					

LO.5	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.5.1. Rèn luyện năng lực tư duy độc lập trong nghiên cứu đường lối, chiến lược, sách lược cách mạng của Đảng. LO.5.2. Có tư duy phê phán, kỹ năng phân tích, tổng hợp và đánh giá những vấn đề liên quan đến môn học. Từ đó, vận dụng kiến thức đã học để chủ động, tích cực nhận thức những vấn đề chính trị, kinh tế, văn hoá, xã hội theo đường lối, chính sách, pháp luật của Đảng và Nhà nước. LO.5.3 Có kỹ năng viết, kỹ năng làm việc cá nhân, làm việc nhóm và trình bày kết quả nghiên cứu.	2.1 2.2 2.3	2.1.1 2.3.1 2.4.4 2.5 3.1.5	U4
5.3. Thái độ					
LO.6	THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	LO.6.1. Tin tưởng vào sự lãnh đạo của Đảng đối với cách mạng Việt Nam. LO.6.2. Quyết tâm phấn đấu thực hiện đường lối cách mạng của Đảng. LO.6.3. Có thái độ nghiêm túc trong học tập, nghiên cứu khoa học, trong nhận thức về cuộc sống, xã hội, tự rèn luyện bản thân trở thành người có phẩm chất , bản lĩnh chính trị vững vàng, có đạo đức, trình độ chuyên môn tốt; hình thành tình cảm, niềm tin vào con đường cách mạng mà dân tộc ta đã lựa chọn.	2.1 2.2 2.3	3.1	U3

6. Kế hoạch giảng dạy theo buổi học (Course Plan):

Buổi (3 tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1	**Giới thiệu về môn học**	LO.1, LO.5;	**Dạy**: - Giới thiệu đề cương môn học - Giới thiệu nội dung đề tài thuyết trình nhóm GHW) **Học ở lớp**: - Chia nhóm (5 SV/nhóm) - Giới thiệu nhóm học tập **Học ngoài lớp**: -Chọn đề tài thuyết trình của nhóm (GHW)	
2	**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	LO.1;	**Dạy**: I. ĐỐI TƯỢNG NGHIÊN CỨU CỦA MÔN HỌC LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM 1. Đối tượng nghiên cứu 2. Phạm vi nghiên cứu II. CHỨC NĂNG, NHIỆM VỤ CỦA MÔN HỌC LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM 1. Chức năng của khoa học Lịch sử Đảng 2. Nhiệm vụ của môn học III. PHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP MÔN LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM 1. Phương pháp luận 2. Các phương pháp cụ thể **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 1.	Thi giữa kỳ (Quiz)
3	**Chương 1** ĐẢNG CỘNG SẢN VIỆT NAM RA ĐỜI VÀ LÃNH ĐẠO ĐẤU TRANH GIÀNH CHÍNH QUYỀN (1930-1945)	LO.2	**Dạy**: 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 3. Thành lập Đảng Cộng sản Việt Nam và Cương lĩnh chính trị	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)

			đầu tiên của Đảng 4. Ý nghĩa lịch sử của việc thành lập Đảng Cộng sản Việt Nam II. ĐẢNG 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 3. Phong trào giải phóng dân tộc 1939-1945 4. Tính chất, ý nghĩa và kinh nghiệm của Cách mạng Tháng Tám năm 1945 **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp**: Đọc trước tài liệu chương 2	
4	**Chương 2** ĐẢNG LÃNH ĐẠO HAI CUỘC KHÁNG CHIẾN, HOÀN THÀNH GIẢI PHÓNG DÂN TỘC, THỐNG NHẤT ĐẤT NƯỚC (1945-1975)	LO.3 LO.5	**Dạy**: I. ĐẢNG LÃNH ĐẠO XÂY DỰNG, BẢO VỆ CHÍNH QUYỀN CÁCH MẠNG VÀ 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 chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946-1950 3. Đẩy mạnh cuộc kháng chiến chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946 đến năm 1950 4. Ý nghĩa lịch sử và kinh nghiệm của Đảng trong lãnh đạo kháng chiến chống thực dân Pháp và can thiệp Mỹ **Dạy:** Chấm thuyết trình & phản biện **Học ở lớp**: Các nhóm thuyết trình tại lớp II. LÃNH ĐẠO XÂY DỰNG	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)

			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. Lãnh đạo cách mạng hai miền giai đoạn 1954-1965 2. Lãnh đạo cách mạng cả nước giai đoạn 1965-1975 3. Ý nghĩa và kinh nghiệm lãnh đạo của Đảng trong cuộc kháng chiến chống Mỹ, cứu nước 1954-1975 **Học ngoài lớp:** Đọc trước tài liệu chương 2	
5	**Chương 3** ĐẢNG LÃNH ĐẠO CẢ NƯỚC QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI VÀ TIẾN HÀNH CÔNG CUỘC ĐỔI MỚI (1975-2018)	LO.4 LO.5	**Dạy**: I. ĐẢNH 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 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 **Dạy:** Chấm thuyết trình & phản biện **Học ở lớp**: Thảo luận tại lớp II. LÃNH ĐẠO CÔNG CUỘC ĐỔI MỚI, ĐẨY MẠNH CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA VÀ HỘI NHẬP QUỐC TẾ (1986-2018) 1. Đổi mới toàn diện, đưa đất nước ra khỏi khủng hoảng kinh tế - xã hội 1986-1996 2. Tiếp tục công cuộc đổi mới, đẩy mạnh công nghiệp hóa, hiện đại hóa và hội nhập quốc tế 1996-2018 3. Thành tựu, kinh nghiệm của công cuộc đổi mới TỔNG LUẬN	Thảo luận nhóm (DIC) Thi cuối kỳ (FEX)

			1. Những thắng lợi vĩ đại của cách mạng Việt Nam 2. Những bài học lớn về sự lãnh đạo của Đảng **Học ngoài lớp**: Hoàn thiện bài thuyết trình	

7. Đánh giá môn học

STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	20%	Thuyết trình và bản báo cáo nhóm	LO.3 LO.4 LO.5
2	Quiz	Bài thi giữa kỳ	Thi theo đề thi chung	30%	Tự luận	LO.1 LO.2;
3	DIC	Thảo luận tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	Cộng tối đa 1 điểm vào bài thi cuối kỳ	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	
4	FEX	Thi cuối kỳ	Đề thi bao quát toàn bộ nội dung môn học	50%	Trắc nghiệm	LO.2; LO.3; LO.4;
			Tổng cộng	**100%**		

8. Tiêu chí đánh giá chuẩn đầu ra môn học

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	- Nắm được đối tượng, mục đích học tập, nghiên cứu và một số yêu cầu cơ bản về phương pháp học tập, nghiên cứu	Chương nhập môn	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.2	Hiểu rõ quá trình ra đời của Đảng Cộng sản Việt Nam (1920-1930),	Chương 1	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV

	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)			
LO.3 LO.5	Nắm rõ 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	Chương 2	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của GV
LO.4 LO.5	Hiểu được quá trình phát triển đường lối và sự lãnh đạo của Đảng 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. Từ đó rút ra được những thắng lợi và những bài học kinh nghiệm trong quá trình lãnh đạo cách mạng của Đảng.	Chương 3	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Ngân hàng đề thi của GV

9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn
- 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 2.

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 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./.

TP. Hồ Chí Minh, ngày 07 tháng 02 năm 2020

KT. TRƯỞNG KHOA
PHÓ TRƯỞNG KHOA

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

TS. Nguyễn Đình Quốc Cường

ĐẠI HỌC QUỐC GIA TP. HỒ CHÍ MINH
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

Tư tưởng Hồ Chí Minh
(Ho Chi Minh's Thoughts)

1. Thông tin chung

Tên môn học (tiếng Việt):	Tư tưởng Hồ Chí Minh
Tên môn học (tiếng Anh):	Ho Chi Minh's Thoughts
Mã số môn học:	PE019IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	2
Số tiết lý thuyết:	*20 (trên lớp)*
Số tiết thực hành:	*10 (trên lớp)*
Số tiết tự học:	*90 (về nhà)*
Môn học trước:	1. Triết học Mác – Lênin, 2. Kinh tế chính trị Mác – Lênin, 3. Chủ nghĩa xã hội khoa học
Giảng viên phụ trách	Khoa Chính trị - Hành chính, ĐHQG-HCM

2. Mục đích/mục tiêu môn học (Course Purposes/Aims)

2.1. 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 đất nước hiện nay.

2.2. 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.

2.3. 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.

3. Mô tả môn học (Course Outlines)

Môn học 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. Tài liệu phục vụ học tập:

- Bộ Giáo dục và Đào tạo (2019), *Giáo trình Tư tưởng Hồ Chí Minh,* Nxb. Chính trị quốc gia, Hà Nội.

- Khoa Chính trị - Hành chính, ĐHQG-HCM, *Tài liệu hướng dẫn học tập Tư tưởng Hồ Chí Minh*

- Hồ Chí Minh (2011), *Toàn tập,* Nxb. Chính trị quốc gia Sự thật, Hà Nội.

- Hồ Chí Minh (2016), *Biên niên tiểu sử,* Nxb. Chính trị quốc gia Sự thật, Hà Nội.

5. Chuẩn đầu ra môn học (Course Learning Outcomes)

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
5.1. Kiến thức					
LO.1	KHÁI NIỆM, ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU VÀ Ý NGHĨA HỌC TẬP MÔN TƯ TƯỞNG HỒ CHÍ MINH	LO.1.1 – Nắm được khái niệm tư tưởng Hồ Chí Minh	2.1	1.1.3	I3
		LO.1.2 – Nắm rõ được đối tượng nghiên cứu.	2.1		
		LO.1.3 - Nắm được một số yêu cầu cơ bản về phương pháp học tập, nghiên cứu môn học tư tưởng Hồ Chí Minh.	2.1		
		LO.1.4 - Nắm được ý nghĩa học tập, nghiên cứu môn học tư tưởng đối với sinh viên.	2.1		
LO.2	CƠ SỞ, QUÁ TRÌNH HÌNH THÀNH VÀ PHÁT TRIỂN TƯ TƯỞNG HỒ CHÍ MINH	LO. 2.1 - Hiểu rõ được cơ sở thực tiễn, tiền đề lý luận và nhân tố chủ quan hình thành tư tưởng Hồ Chí Minh	2.1	1.1.3	I4
		LO.2.2 – Hiểu rõ được quá trình hình thành và phát triển tư tưởng Hồ Chí Minh.	2.1		
		LO.2.3 – Nắm được giá trị tư tưởng			

		Hồ Chí Minh đối với cách mạng Việt Nam và sự phát triển tiến bộ của nhân loại.	2.1		
LO.3	TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC VÀ CHỦ NGHĨA XÃ HỘI	LO.3.1 – Nhận thức được bản chất khoa học, cách mạng và những sáng tạo tư tưởng Hồ Chí Minh về độc lập dân tộc và cách mạng giải phóng dân tộc.	2.1	1.1.3	I3
		LO.3.2 – Nắm được quan điểm của Hồ Chí Minh về tính tất yếu đi lên chủ nghĩa xã hội, xây dựng chủ nghĩa xã hội và thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam.	2.1		
		LO.3.3 – Nắm được quan điểm Hồ Chí Minh về mối quan hệ giữa độc lập dân tộc và chủ nghĩa xã hội.	2.1	1.1.3	T4
		LO.3.4 – Vận dụng tư tưởng Hồ Chí Minh về độc lập dân tộc gắn liền với chủ nghĩa xã hội trong sự nghiệp cách mạng hiện nay.	2.1		
LO.4	TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẢNG CỘNG SẢN VIỆT NAM VÀ NHÀ NƯỚC CỦA NHÂN DÂN, DO NHÂN DÂN, VÌ NHÂN DÂN	LO.4.1 – Nắm được nội dung cơ bản tư tưởng Hồ Chí Minh về Đảng Cộng sản Việt Nam	2.1	1.1.3	I4
		LO.4.2 - Nắm được nội dung cơ bản tư tưởng Hồ Chí Minh về nhà nước của nhân dân, do nhân dân, vì nhân dân	2.1		I4
		LO.4.3 – Vận dụng tư tưởng Hồ Chí Minh vào công tác xây dựng Đảng và xây dựng Nhà nước.	2.1		T4
LO.5	TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT TOÀN DÂN TỘC VÀ ĐOÀN KẾT QUỐC TẾ	LO.5.1 – Hiểu được những quan điểm cơ bản của tư tưởng Hồ Chí Minh về đại đoàn kết toàn dân tộc.	2.1	1.1.3	I4
		LO.5.2 –Hiểu được những quan điểm cơ bản của tư tưởng Hồ Chí Minh về đoàn kết quốc tế.	2.1		
		LO.5.3 – Vận dụng tư tưởng Hồ Chí Minh về đại đoàn kết dân tộc và đoàn kết quốc tế trong giai đoạn hiện nay	2.1		T4
LO.6	TƯ TƯỞNG HỒ CHÍ MINH VỀ VĂN HÓA, ĐẠO ĐỨC, CON NGƯỜI	LO.6.1 – Nắm được kiến thức cơ bản tư tưởng Hồ Chí Minh về văn hóa.	2.1	1.1.3	I4
		LO.6.2 – Nắm được kiến thức cơ bản tư tưởng Hồ Chí Minh về đạo đức mới (đạo đức cách mạng).	2.1		

		LO.6.3 – Nắm được kiến thức cơ bản tư tưởng Hồ Chí Minh về văn hóa.	2.1		I4
		LO.6.4 – Vận dụng tư tưởng Hồ Chí Minh về văn hóa, đạo đức, con người trong việc xây dựng văn hóa, đạo đức, con người Việt Nam hiện nay.	2.1		T4
5.2. Kỹ năng					
LO.7	THỂ HIỆN KHẢ NĂNG TƯ DUY, PHÂN TÍCH, ĐÁNH GIÁ, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.7.1 Có kỹ năng tư duy, phân tích, đánh giá tư tưởng Hồ Chí Minh.	2.2	2.1.1 2.3.1	U4
		LO.7.2. Có kỹ năng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn	2.2	2.4.4	
		LO.7.3. Có kỹ năng 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.	2.2	2.5 3.1.5	
5.3. Thái độ					
LO.7	THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VA SAU KHI HỌC TẬP	LO.6.1. Nhận thức được vai trò, giá trị của tư tưởng Hồ Chí Minh đối với Đảng và dân tộc Việt Nam.	2.3		U3
		LO.6.2. Có bản lĩnh chính trị, yêu nước, trung thành với mục tiêu, lý tưởng độc lập dân tộc gắn liền với chủ nghĩa xã hội.	2.3	3.1	
		LO.6.3. Thấy được trách nhiệm của bản thân trong việc học tập, nghiên cứu, vận dụng trong cuộc sống, góp phần vào sự nghiệp xây dựng và bảo vệ Tổ quốc.	2.3		

6. Kế hoạch giảng dạy theo buổi học (Course Plan):

Buổi (3 tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1		**LO.1,**	**Dạy:**	

(1 tiết)	**Giới thiệu về môn học**	**LO.5;**	- Giới thiệu đề cương môn học - Giới thiệu nội dung đề tài thuyết trình nhóm GHW). **Học ở lớp**: - Chia nhóm (5 SV/nhóm) - Giới thiệu nhóm học tập **Học ngoài lớp**: -Chọn đề tài thuyết trình của nhóm (GHW). - Đọc trước tài liệu chương 1.	
2	**Chương 1** KHÁI NIỆM, ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU VÀ Ý NGHĨA HỌC TẬP MÔN TƯ TƯỞNG HỒ CHÍ MINH	LO.1;	**Dạy**: I. KHÁI NIỆM TƯ TƯỞNG HỒ CHÍ MINH II. ĐỐI TƯỢNG NGHIÊN CỨU MÔN HỌC TƯ TƯỞNG HỒ CHÍ MINH III. PHƯƠNG PHÁP NGHIÊN CỨU 3. Phương pháp luận của việc nghiên cứu tư tưởng Hồ Chí Minh 4. Một số phương pháp cụ thể IV. Ý NGHĨA CỦA VIỆC HỌC TẬP MÔN HỌC TƯ TƯỞNG HỒ CHÍ MINH 1. Góp phần nâng cao năng lực tư duy lý luận 2. Giáo dục và thực hành đạo đức cách mạng, củng cố niềm tin khoa học gắn liền với trau dồi tình cảm cách mạng, bồi dưỡng lòng yêu nước 3. Xây dựng, rèn luyện phương pháp và phong cách công tác. **Học ở lớp**: Trao đổi, phát biểu trên lớp **Học ngoài lớp**: - Phác thảo nội dung thuyết trình nhóm GHW - Đọc trước tài liệu chương 2.	
3	**Chương 2** CƠ SỞ, QUÁ TRÌNH HÌNH THÀNH VÀ PHÁT TRIỂN TƯ TƯỞNG HỒ CHÍ	LO.2	**Dạy**: I. CƠ SỞ HÌNH THÀNH TƯ TƯỞNG HỒ CHÍ MINH 1. Cơ sở thực tiễn 2. Cơ sở lý luận	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)

	MINH		3. Nhân tố chủ quan II. QUÁ TRÌNH HÌNH THÀNH VÀ PHÁT TRIỂN TƯ TƯỞNG HỒ CHÍ MINH 1. Thời kỳ trước ngày 5 – 6-1911: Hình thành tư tưởng yêu nước và có chí hướng tìm con đường mới 2. Thời kỳ từ năm 1911 đến cuối năm 1920: Dần dần hình thành tư tưởng cứu nước, giải phóng dân tộc Việt Nam theo con đường cách mạng vô sản 3. Thời kỳ từ cuối năm 1920 đến đầu năm 1930: Hình thành những nội dung cơ bản tư tưởng về cách mạng Việt Nam 4. Thời kỳ đầu năm 1930 đến đầu năm 1941: Vượt qua thử thách, giữ vững đường lối, phương pháp cách mạng Việt Nam đúng đắn, sáng tạo 5. Thời kỳ từ đầu năm 1941 đến tháng 9 – 1969: Tư tưởng Hồ Chí Minh tiếp tục phát triển, hoàn thiện, soi đường cho sự nghiệp cách mạng của Đảng và nhân dân ta III. GIÁ TRỊ TƯ TƯỞNG HỒ CHÍ MINH 1. Đối với cách mạng Việt Nam 2. Đối với sự phát triển tiến bộ của nhân loại **Học ở lớp**: Thảo luận và phát biểu trên lớp **Học ngoài lớp:** Đọc trước tài liệu chương 3	
4	**Chương 3** TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC GẮN LIỀN VỚI CHỦ NGHĨA XÃ HỘI	LO.3 LO.5	**Dạy**: I. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC 1. Vấn đề độc lập dân tộc 2. về cách mạng giải phóng dân tộc **Dạy:** Chấm thuyết trình & phản	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)

			biện **Học ở lớp**: Các nhóm thuyết trình tại lớp II. TƯ TƯỞNG HỒ CHÍ MINH VỀ CHỦ NGHĨA XÃ HỘI VÀ XÂY DỰNG CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM 1. Tư tưởng Hồ Chí Kinh về chủ nghĩa xã hội 2. Tư tưởng Hồ Chí Minh về xây dựng chủ nghĩa xã hội ở Việt Nam 3. Tư tưởng Hồ Chí Minh về thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam III. TƯ TƯỞNG HỒ CHÍ MINH VỀ MỐI QUAN HỆ GIỮA ĐỘC LẬP DÂN TỘC VÀ CHỦ NGHĨA XÃ HỘI 1. Độc lập dân tộc là cơ sở, tiền đề để tiến lên chủ nghĩa xã hội 2. Chủ nghĩa xã hội là điều kiện để đảm bảo nền độc lập dân tộc vững chắc IV. VẬN DỤNG TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC GẮN LIỀN VỚI CHỦ NGHĨA XÃ HỘI TRONG SỰ NGHIỆP CÁCH MẠNG VIỆT NAM GIAI ĐOẠN HIỆN NAY 1. Kiên định mục tiêu và con đường cách mạng mà Hồ Chí Minh đã xác định 2. Phát huy sức mạnh dân chủ xã hội chủ nghĩa 3. Củng cố, kiện toàn, phát huy sức mạnh và hiệu quả hoạt động của toàn hệ thống chính trị 4. Đấu tranh chống những biểu hiện suy thoái ề tư tưởng chính trị, đạo đức, lối sống và"tự diễn biến", "tự chuyển hóa" trong nội bộ	

			Học ngoài lớp: Đọc trước tài liệu chương 4	
5	**Chương 4** **TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẢNG CỘNG SẢN VỆT NAM VÀ NHÀ NƯỚC CỦA NHÂN DÂN, DO NHÂN DÂN VÀ VÌ NHÂN DÂN**	LO.4 LO.5	**Dạy**: I. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẢNG CỘNG SẢN VIỆT NAM 1. Tính tất yếu và vai trò lãnh đạo của Đảng Cộng sản Việt Nam 2. Đảng phải trong sạch, vững mạnh **Dạy:** Chấm thuyết trình & phản biện **Học ở lớp**: Thảo luận tại lớp II. TƯ TƯỞNG HỒ CHÍ MINH VỀ NHÀ NƯỚC CỦA NHÂN DÂN, DO NHÂN DÂN, VÌ NHÂN DÂN 1. Nhà nuoqsc dân chủ 2. Nhà nước pháp quyền 3. Nhà nước trong sạch, vững mạnh III. VẬN DỤNG TƯ TƯỞNG HỒ CHÍ MINH VÀO CÔNG TÁC XÂY DỰNG ĐẢNG VÀ XÂY DỰNG NHÀ NƯỚC 1. Xây dựng Đảng thật sự trong sạch, vững mạnh 2. Xây dựng Nhà nước **Học ngoài lớp**: Hoàn thiện bài thuyết trình	Thảo luận nhóm (DIC) Thi cuối kỳ (FEX)
6	**Chương 5** **TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT DÂN TỘC VÀ ĐOÀN KẾT QUỐC TẾ**		**Dạy:** I. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT DÂN TỘC 1. Vai trò của đại đoàn kết dân tộc 2. Lực lượng của khối đại đoàn kết dân tộc 3. Điều kiện để xây dựng khối đại đoàn kết toàn dân tộc 4. Hình thức, nguyên tắc tổ chức của khối đại đoàn kết dân tộc – Mặt trận dân tộc thống	

			nhất 5. Phương thức xây dựng khối đại đoàn kết dân tộc **Dạy:** Chấm thuyết trình & phản biện **Học ở lớp**: Thảo luận tại lớp II. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐOÀN KẾT QUỐC TẾ 1. Sự cần thiết phải đoàn kết quốc tế 2. Lực lượng đoàn kết quốc tế và hình thức tổ chức 3. Nguyên tắc đoàn kết quốc tế III. VẬN DỤNG TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT DÂN TỘC VÀ ĐOÀN KẾT QUỐC TẾ TRONG GIAI ĐOẠN HIỆN NAY 1. Quán triệt tư tưởng Hồ Chí Minh về đại đoàn kết dân tộc và đoàn kết quốc tế trong hoạch định chủ trương, đường lối của Đảng 2. xây dựng khối đại đoàn kết toàn dân tộc trên nền tảng liên minh công – nông – trí thức dưới sự lãnh đạo của Đảng 3. Đại đoàn kết dân tộc phải kết hợp với đoàn kết quốc tế	
7	**Chương 6** **TƯ TƯỞNG HỒ CHÍ MINH VỀ VĂN HÓA, ĐẠO ĐỨC, CON NGƯỜI**		**Dạy:** I. TƯ TƯỞNG HỒ CHÍ MINH VỀ VĂN HÓA 1. Một số nhận thức chung về văn hóa và quan niệm giữa văn hóa với các lĩnh vực khác 2. Quan điểm của Hồ Chí Minh về vai trò của văn hóa 3. Quan điểm của Hồ Chí Minh về xây dựng nền văn hóa mới **Dạy:** Chấm thuyết trình & phản biện **Học ở lớp**: Thảo luận tại lớp II. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠO ĐỨC 1. Quan điểm về vai trò và sức mạnh của đạo đức cách mạng	

			2. Quan điểm về những chuẩn mực đạo đức cách mạng 3. Quan điểm về những nguyên tắc xây dựng đạo đức cách mạng III. TƯ TƯỞNG HỒ CHÍ MINH VỀ CON NGƯỜI 1. Quan niệm Hồ Chí Minh về con người 2. Quan niệm của Hồ Chí Minh về vai trò của con người 3. Quan niệm Hồ Chí Minh về xây dựng con người IV. XÂY DỰNG VĂN HÓA, ĐẠO ĐỨC, CON NGƯỜI VIỆT NAM HIỆN NAY THEO TƯ TƯỞNG HỒ CHÍ MINH 1. Xây dựng và phát triển văn hóa, con người 2. Về xây dựng đạo đức cách mạng	

7. Đánh giá môn học

STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	150%	Thuyết trình và bản báo cáo nhóm	LO.2; LO.3; LO.4; LO.5; LO.6.
2	Quiz	Bài thi giữa kỳ	Giảng viên cho thi	20%	Trắc nghiệm (đề đóng) hoặc tự luận (đề mở)	LO.2; LO.3.
3	DIC	Thảo luận tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	15%	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	LO.3; LO.4; LO.5; LO.6.

4	FEX	Thi cuối kỳ	Thi đề chung Đề thi bao quát toàn bộ nội dung môn học	50%	Tự luận (đề mở)	LO.2; LO.3; LO.4; LO.5; LO.6.
			Tổng cộng	**100%**		

8. Tiêu chí đánh giá chuẩn đầu ra môn học

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	- Hiểu được khái niệm tư tưởng Hồ Chí Minh. - Nắm được đối tượng; phương pháp nghiên cứu tư tưởng Hồ Chí Minh và ý nghĩa học tập môn tư tưởng Hồ Chí Minh.	Chương 1	Hỏi - Đáp	Cộng điểm
LO.2	- Hiểu rõ cơ sở, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh . - Nắm được giá trị tư tưởng Hồ Chí Minh đối với cách mạng Việt Nam và thế giới.	Chương 2	Thi giữa kỳ (Quiz)	Đề thi của GV
LO.3	- Nắm rõ nội dung tư tưởng Hồ Chí Minh về độc lập dân tộc và chủ nghĩa xã hội; mối quan hệ giữa độc lập dân tộc và chủ nghĩa xã hội. - Hiểu được sự vận dụng tư tưởng Hồ về độc lập dân tộc và chủ nghĩa xã hội của Đảng Cộng sản Việt Nam và Nhà nước ta.	Chương 3	Thuyết trình nhóm (GHW) Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Đề thi của GV Ngân hàng đề thi của khoa Chính trị - Hành chính

LO.4	- Nắm rõ nội dung tư tưởng Hồ Chí Minh về Đảng Cộng sản Việt nam và Nhà nước của dân, do dân, vì dân. - Hiểu được sự vận dụng của Đảng và Nhà nước ta vào công tác xây dựng Đảng và xây dựng Nhà nước.	Chương 4	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của khoa Chính trị - Hành chính
LO.5	- Nắm được nội dung tư tưởng Hồ Chí Minh về đại đoàn kết toàn dân tộc và đoàn kết quốc tế. - Hiểu được sự vận dụng của Đảng và Nhà nước ta trong việc hoạch định chủ trương, đường lối, chính sách về đại đoàn kết dân tộc và đối ngoại.	Chương 5	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của khoa Chính trị - Hành chính
LO.6	- Nắm được nội dung tư tưởng Hồ Chí Minh về văn hóa, đạo đức, con người. - Vận dụng tư tưởng Hồ Chí Minh về văn hóa, đạo đức và con người trong việc rèn luyện, tu dưỡng bản thân.	Chương 6	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của khoa Chính trị - Hành chính

9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn

- 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 2.

+ 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 GHW 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 07 tháng 02 năm 2020

KT.TRƯỞNG KHOA
PHÓ TRƯỞNG KHOA

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

PS.Nguyễn Đình Quốc Cường

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

COURSE SYLLABUS

General Law

PE021IU

1. General information

Course name	- (in English): General Law - (in Vietnamese): Pháp luật đại cương
Course classification	Foundation course
Course designation	Face to face
Course type	☑ *General knowledge* ☐ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
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

[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 credits (Theory: 3 + Practice: 0) 4.64 ECTS	
Number of periods	Theory: 45 Practice: 0	
Required and recommended prerequisites for joining the course	N/A	
Course objectives	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.	
Course learning outcomes	Upon the successful completion of this course, students will be able to:	
	Competency level	**Course learning outcome (CLO)**
	Knowledge	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.

<table>
<tr><td rowspan="2"></td><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>
<tr><td>Content</td><td colspan="2">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 colspan="2">Multiple choice questions
Case-based exams
Essay exams
Oral exams</td></tr>
<tr><td>Study and examination requirements</td><td colspan="2">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:
<table>
<tr><td>Assignment</td><td>20%</td></tr>
<tr><td>Midterm examination</td><td>30%</td></tr>
<tr><td>Final examination</td><td>50%</td></tr>
<tr><td>Total</td><td>100%</td></tr>
</table>
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</td></tr>
</table>

	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	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

	responsibilities of citizens. Relationship between citizens and the State. • Structure, functions and duties of Vietnamese state, especially in prevention of corruption				
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 • Crimes • Punishments	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
7	**Criminal Law (Cont)**	1-5 (Level	Tests Peer evaluations	Discussions Case studies,	PPT– Criminal law available on

	• Crimes related to corruption • Punishments for corruption	R - reinforced)	Class-performance evaluations	especially cases related to corruption	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.) • Employment contracts • Labor disciplines • Dispute settlements	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
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 have 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	Shows little information from sources. Poor handling of	Shows moderate amount of source information	Draws upon sources to support most points. Some	Draws upon primary and secondary source information in useful and

			primary and secondary sources	sources	incorporated. Some key points supported by sources. Quotations may be poorly integrated into paragraphs. Some possible problems with source citations	evidence may not support arguments or may appear where inappropriate. Quotations integrated well into paragraphs. Sources cited correctly	illuminating ways to support key points. Excellent integration of quoted material into paragraphs. Source cited correctly
4	CLO 2	**Use of frameworks**	Shows no effort to structure problems in correspondence to theoretical frameworks	Shows limited ability to structure problems in correspondence to theoretical frameworks	Shows effort to link problems with the theoretical frameworks. There are still some mistakes	Shows ability to structure problems in correspondence to theoretical frameworks correctly. Minor mistakes in resolving problems	Shows ability to structure problems in correspondence to 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	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.

				offered are irrelevant.			

Ho Chi Minh City, April 2024

Head of Office of Academic Affairs

Huỳnh Khả Tú

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** Department of Mathematics

COURSE SYLLABUS
Course Name: Calculus 1
Course Code: MA001IU

Course name	- (in English): Calculus 1 - (in Vietnamese): Toán 1
Course designation	This course equip students with basic concepts of calculus: limits, continuity, differentiation, and integration. Applications of these concepts are extensively discussed.
Course type	☑ *General knowledge* ☐ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	1, 2
Person responsible for the course	
Language	English
Relation to curriculum	Compulsory
Teaching methods	• Lecturers • Assignment
Workload (incl. contact hours, self-study hours)	• (Estimated) Total workload: 120 hours • Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 (lectures)

<table>
<tr><td></td><td>• Private study including examination preparation, specified in hours: 60 hours</td></tr>
<tr><td>Credit points</td><td>4 credits (Theory: 4 + Practice: 0)
6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 60
Practice: 0</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>1. To provide the students with the main ideas and techniques of calculus, concerning limits, continuity, differentiation and integration.
2. 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.
3. To develop skills in mathematical modeling 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.</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>CLOI. Have basic knowledge of limits and derivatives (Program outcomes: a)
CLO2. Have basic knowledge of definite/indefinite integrals
(Program outcomes: a)</td></tr>
<tr><td>Skill</td><td>CLO3. Can compute often used limits, can define and compute derivatives (Program outcomes: a, j)
CLO4. Can compute standard types of integrals. Use integrals in practical situations (Program outcomes: a, j)</td></tr>
</table></td></tr>
</table>

	Attitude	CLO5. Confident when dealing with derivatives and integrals. Comfortable with using derivatives and integrals in practical situations. (Program outcome: j, k)

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**
Functions and Graphs, Inverse Functions, Exponential and Logarithmic Functions	1	I,T
Parametric Curves, Limit. One-sided Limits, Laws of Limit	1	I.T
Evaluating Limits. The Squeeze Theorem. Continuity. The Intermediate Value Theorem	1	T, U
Tangent Lines and Velocity Problems. Rates of Change, Derivative.	1	T, U
Higher-Order Derivatives, Rules of Differentiation. Rates of Change in the Natural and Social Sciences	1	T, U
Implicit Differentiation, Differentiation of Inverse Functions,	1	T, U
Logarithmic Differentiation, Linear Approximations. Differentials.	1	T, U
Related Rates, Maxima and Minima. Critical Point, The Mean Value Theorem.	1	T, U
The First and Second Derivative Test, Concavity. Shapes of Curves, Curve Sketching	1	T,U
Indeterminate Forms and l'Hopital's Rules, Maxima and Minima Problems, Newton's Method	1	T, U
Anti-derivatives and Indefinite Integrals, The Definite Integral	1	I,T

		Properties of the Definite Integral. The Fundamental Theorem of Calculus, Integration by Substitution	1	I, T,U
		Integration by Parts, Partial Fractions, Numerical Integration,	1	T, U
		Improper Integrals, Areas between Curves Areas Enclosed by Parametric Curves	1	T, U
		Volumes, Arc Length, Applications to Engineering, Economics and Science	1	T,U
Examination forms	Written 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	• J. Stewart, *Calculus,* Thomson Learning, 7th edition, 2012.			

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:

	PLO										
CLO	a	b	c	d	e	f	g	h	i	j	k
1	X										
2	X										
3										X	
4										X	
5										X	X

3. Planned learning activities and teaching methods

Week	Topics	CLO	Assessment	Teaching and Learning activities
1	Functions and Graphs, Inverse Fun Exponential and Logarithmic Function	1,3		Lecture

2	Parametric Curves, Limit. One-sided Laws of Limits.	1,3	Quiz	Lectures and Quiz
3	Evaluating Limits. The Squeeze Theorem. Continuity. The Intermediate Value Theorem	3, 5	Quiz	Lectures and Quiz
4	The Tangent and Velocity Problems. Rates of Change, The Derivative.	3, 5	HW1	Lectures and HW
5	Higher-Order Derivatives, Rules of Differentiation. Rates of Change in the Natural and Social Sciences	3, 5	Quiz	Lectures and Quiz
6	Implicit Differentiation, Differentiation of Inverse Functions,	3, 5	HW2	Lectures and HW
7	Logarithmic Differentiation, Linear Approximations. Differentials.	3, 5	Quiz	Lectures and Quiz
8	Related Rates, Maxima and Minima. Critical Point, The Mean Value Theorem.	3, 5	HW3	Lectures and HW
Midterm Exam				
9	The First and Second Derivative Test, Concavity. Shapes of Curves, Curve Sketching	2,4	Quiz	Lectures and Quiz
10	Indeterminate Forms and l'Hopital's Rules, Maxima and Minima Problems, Newton's Method	2,4	Quiz	Lectures and Quiz
11	Anti-derivatives and Indefinite Integrals, The Definite Integral	4, 5	HW4	Lectures and HW
12	Properties of the Definite Integral. The Fundamental Theorem of Calculus, Integration by Substitution	2,4	Quiz	Lectures and Quiz
13	Integration by Parts, Partial Fractions, Numerical Integration,	4, 5	Quiz	Lectures and Quiz
14	Improper Integrals, Areas between Curves Areas Enclosed by Parametric Curves	2, 4, 5	HW5	Lectures and HW

15	Volumes, Arc Length, Applications to Engineering, Economics and Science	1,2, 3,4, 5	Exercises	
Final Exam		1, 2, 3, 4, 5		

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
In-class exercises/ quizzes (10%)	Qz1->Qz4 80% Pass	Qz5->Qz8 80%Pass	Qz1->Qz4 80% Pass	Qz5->Qz8 80% Pass	Qz2, 4, 6, 8 70% Pass
Homework exercises (10%)	HW1->H3 70% Pass	HW4, HW5 70%	HW1->HW3 70% Pass	HW4, HW5 70%	HW1->HW5 60% Pass
Midterm exam (30%)	Qz1, Qz2 80% Pass		Q3,Q4 70% Pass		Q5 50%
Final exam (50%)		Q1,Q2 80%Pass		Q3,Q4 70%Pass	Q5 50%

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

5. Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Head/Dean of Department/School

Phạm Hữu Anh Ngọc

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS
Course Name: Linear Algebra
Course Code: IT154IU

1. General information

Course name	- (in English): Linear Algebra - (in Vietnamese): Đại số tuyến tính
Course designation	Linear algebra provides a mathematical framework for organizing information and then using that information to solve problems, especially data analytics problems. Linear algebra is essential for understanding and creating machine learning algorithms, especially neural network and deep learning models.
Course type	☑ *General knowledge* ☐ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	2, 3
Person responsible for the course	Mai Hoang Bao An, PhD.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, demo.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 127.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 37.5 hours (lecture)

	Private study including examination preparation, specified in hours: 90
Credit points	3 credits (Theory: 3 + Practice: 0) 4.64 ECTS
Number of periods	Theory: 45 Practice: 0
Required and recommended prerequisites for joining the course	Calculus 1 Fundamentals of programming
Course objectives	This course will provide students with the foundations of linear algebra knowledge necessary for machine learning and neural network modelling. Students will learn the overview of basic matrices and vector algebra as applied to linear systems. Then they will learn how to manipulate matrices to derive useful knowledge from data, quantify the degree of learning, and optimizing the speed of learning in vector spaces and linear transformations for data discovery. The hands-on lessons and assignments will equip students with the mathematical background required to build and train simple neural networks in data mining applications.
Course learning outcomes	CLO 1. Understand concepts of vector space, matrices, tensor, linear system and their application in other fields of study. Get familiar with the fundamental concepts of linear spaces. CLO 2. Know how to use Python to handle with matrices and linear systems. Get to know and understand the fundamental concepts of abstract vector spaces and their relationships with matrix algebra. CLO 3. Understand the concepts and applications of linear dependence/independence, spans and linear transformation. Apply principles of matrix algebra to linear transformation. Understand the Isomorphic Vector Spaces and applications. CLO 4. Determine eigenvalues and eigenvectors and solve eigenvalue problems. Introduction to determinant and its properties and applications. The use case of carrying out matrix operations in machine learning.

Competency level	Course learning outcome (CLO)
Knowledge	CLO 1, CLO 2, CLO 3, CLO 4
Skill	CLO 2, CLO 4
Attitude	CLO 1, CLO 2, CLO 3, CLO 4

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 python, colab What is linear structures	1	I, U
Fundamentals and geometry of $\mathbb{R}^n$ space Matrix algebra: vectors, matrices. Linear systems, parametric equations and systems of linear equations	2	T, U
Solving systems of linear equations Subspace of $\mathbb{R}^n$, linear independence, base and dimension in $\mathbb{R}^n$ Python in linear algebra	2	T, U
Solving linear system with numpy Norm in $\mathbb{R}^n$ with Python	1	T, U
Abstract vector spaces, base and dimension for abstract vector spaces. Special kinds of matrices and vectors.	1	T, U
Span in abstract vector spaces. Fundamentals of linear transformations. Demo of linear transformations in Python.	2	T, U
Linear Transformation in abstract vector space Linear Transformation and Inverses	1	T, U
Geometric Transformation of Plane, Image and Kernel, Isomorphism and linear map Isomorphic Vector Spaces	1	I, T, U
Introduction to determinant Determinant expansions. Properties of determinant.	1	I, T

	Elementary Row Operations and the Determinant Eigenvectors and Eigenvalues, Eigen-decompositions Introduction to some application of linear algebra: PCA, OLS, …	2	I, T, U
Examination forms	Short-answer questions, Long-answer questions, programming 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. R.O. Hill, Elementary Linear Algebra and Its applications, 3rd edition 2. B. Kolman and David R. Hill, Introductory Linear Algebra: An Applied First Course (8th edition, 9th edition) 3. Jim Hefferon, Linear Algebra, 4th edition. 4. github: Python in linear algebra, matrix computing.		

2. Learning Outcomes Matrix

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			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to python, colab What is linear structures Introduction to matrix	1		Lecture, Discussion	[1, 2, 3]. Chapter 1

2-3	Fundamentals and geometry of $\mathbb{R}^n$ space Matrix algebra: vectors, matrices. Linear systems, parametric equations and systems of linear equations	1	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 2, 3, 4
4-5	Solving systems of linear equations Subspace of $\mathbb{R}^n$, linear independence, base and dimension in $\mathbb{R}^n$ Python in linear algebra	1, 2	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 4, 5, 6 [4] Chapter 1,2,3
6	Solving linear system with numpy Norm in $\mathbb{R}^n$ with Python	1, 2		Lecture, In-class Discussion	[4]. Chapter 3, 4, 5
7	Abstract vector spaces, base and dimension for abstract vector spaces. Special kinds of matrices and vectors.	1, 2	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 6, 7, 8
8	**Midterm**				
9-10	Span in abstract vector spaces. Fundamentals of linear transformations. Demo of linear transformations in Python.	3, 4	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 8, 9, 10 [4] Chapter 6, 7
11	Linear Transformation in abstract vector space Linear Transformation and Inverses	3	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 10, 11, 12
12	Geometric Transformation of Plane, Image and Kernel, Isomorphism and linear map Isomorphic Vector Spaces	3	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 11, 12, 13

13	Introduction to determinant Determinant expansions. Properties of determinant	3, 4	Quiz	Lecture, In-class Quiz	[1, 2]. Chapter 13. 14, 15
14-15	Elementary Row Operations and the Determinant Eigenvectors and Eigenvalues, Eigen-decompositions Introduction to some application of linear algebra: PCA, OLS, …	3, 4	Exercises	Lecture, In-class exercises	[2, 3]. Chapter 14, 15, 16 [4] Chapter 8, 9, 10
16	Revision			Review-test	
17	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Labs (20%)	25%	25%	25%	25%
Midterm examination (30%)	50%	50%		
Projects/Presentations/ Report (10%)			50%	50%
Final examination (40%)		25%	25%	50%

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

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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.↩

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%)			
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	Identifies own and others' assumptions and several relevant contexts when	Questions some assumptions. Identifies several relevant contexts when	Shows an emerging awareness of present assumptions

	and carefully evaluates the relevance of contexts when presenting a position.	presenting a position.	presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	(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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications)	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications)

	discussed in priority order.	are identified clearly.	and implications) are identified clearly.	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	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 presentation is	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.

	appropriate to audience.	appropriate to audience.	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	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/	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/	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/

	credibility/ authority on the topic.	authority on the topic.	authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** Department of Mathematics

COURSE SYLLABUS

Course Name: Probability, Statistic & Random Process

Course Code: MA026IU

Course name	- (in English): Probability, Statistic & Random Process - (in Vietnamese): Xác suất, thống kê và quy trình ngẫu nhiên
Course designation	The course is aimed to provide the beginning students in engineering with the simple concepts and techniques of probabilistic and statistics models and stochastic processes.
Course type	☑ *General knowledge* ☐ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	1, 2, 3
Person responsible for the course	Dr. Ta Quoc Bao Dr. Pham Hai Ha
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.

<table>
<tr><td>Workload (incl. contact hours, self-study hours)</td><td>(Estimated) Total workload: 135 hours
Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 hours
Private study including examination preparation, specified in hours: 90 hours</td></tr>
<tr><td>Credit points</td><td>3 credits (Theory: 3 + Practice: 0)
4.64 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 0</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Calculus 1 and Calculus 2</td></tr>
<tr><td>Course objectives</td><td>Students will be provided with skills of using data from a variety of sources, be introduced to contemporary computing and database environments, such as R/Python, and be exposed to case studies from outside the classroom. Through this unit, students will become acquainted with the challenges of contemporary data science and gain an appreciation of the foundational skills necessary to turn data into information.</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. Identify basic concept such as sample space, events, probability, conditional probability, independence; distribution and mean, variance of random variables; important statistics including sample mean, sample proportion, sample variance and sample standard deviation.</td></tr>
<tr><td>Skill</td><td>CLO2. Compute probability of simple and complicated events with probability rules; Evaluate probability, mean and variance of random variables and function of random variables.
CLO3. Conduct estimate parameter(s) and hypothesis testing procedure from sample data.
CLO4. Calculate transition probability, unconditional distribution, classify state and find stationary distribution of a Markov chain.</td></tr>
<tr><td>Attitude</td><td></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>Introduction to Probability</td><td>1</td><td>I, T</td></tr>
<tr><td>Counting techniques</td><td>1</td><td>T, U</td></tr>
<tr><td>Conditional probability and probability rules</td><td>2</td><td>T, U</td></tr>
<tr><td>Random variables and mathematical expectation</td><td>4</td><td>T, U</td></tr>
<tr><td>Markov chain</td><td>2</td><td>T, U</td></tr>
<tr><td>Introduction to Statistics and Statistics Descriptive</td><td>1</td><td>I, T</td></tr>
<tr><td>Parameter estimation</td><td>2</td><td>T, U</td></tr>
<tr><td>Hypothesis testing</td><td>2</td><td>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>1. R. Walpole et al, Probability and Statistics for Engineers and Scientists, 9th edition.
2. S. Ross, Introduction to Probability Models, 9th edition.
3. S. Ross, Introduction Probability and Statistics for Engineers and Scientist, 3th edition</td></tr>
</table>

2. Learning Outcome 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						
2						
3						
4						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to probability	1	Quizl	Lecture, HW	[l].l, [2].2, [3].3
2	Counting techniques	2		Lecture, HW	[1].2
3-4	Calculating probability	2	Quiz2	Lecture HW	[1].2, [2].l, [3].3
5-6	Random variables	2	Quiz3	Lecture, HW	[1].3, [2].2,3, [3].1,4
7	Mean - Variance - Covariance	2	HW1	Lecture, Discussion, HW	[1].4, [2].2, [3].4
8	Special distributions	2		Lecture, HW	[1].5,6, [2].2, [3].5
9	Midterm				
10-11	Markov chain	4	HW2	Lecture, Discussion, HW	[2].4
12	Descriptive statistics	1		Lecture, Discussion, HW	[1]. 1 [3]. 2
13-14	Parameter estimation	3	Quiz4	Lecture, Discussion, HW	[1]. 9 [3]. 7
15-16	Hypothesis testing	3	Quiz5	Lecture, Discussion, HW	[1]. 10 [3]. 8
17	Final Exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes (10%)	Qzl 70%Pass	Qz2, Qz3 70%Pass	Qz3, Qz4 70% Pass	

Homework exercises (10%)	HW1 70%Pass			HW2 70%Pass
Midterm exam (30%)	Part I 70%Pass	Part II 70%Pass		
Final exam (50%)			Part II 70%Pass	Part I 70%Pass

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

5. Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Head/Dean of Department/School

Phạm Hữu Anh Ngọc

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Statistical Method

Course Code: IT151IU

1. General information

Course name	- (in English): Statistic method - (in Vietnamese): Phương pháp thống kê
Course designation	This subject introduces the students to the fundamentals of probability and statistics and several related algorithms popularly used in data analytics and signal processing. It is designed for practical aspect.
Course type	☑ *General knowledge* ☐ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	2,4
Person responsible for the course	Mai Hoang Bao An, PhD.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 127.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours

<table>
<tr><td></td><td>Private study including examination preparation, specified in hours: 90 hours</td></tr>
<tr><td>Credit points</td><td>3 credits (Theory: 3 + Practice: 0)
4.64 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 0</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Fundamentals of programming
Calculus 2
Probability, Statistics and Random Process</td></tr>
<tr><td>Course objectives</td><td>Introduce to some topics in statistics in which learning statistical concepts and building models in Python. The course contains three parts:
1. Learn how to visualize, wrangle and simulate data in Python.
2. Estimate model parameter(s) with several methods including moment method, least square errors, maximum likelihood estimation and Bayes estimation. Introduce to nonparametric method
3. Study some classical statistical models including linear regression, logistic regression. Learn how to estimate model parameters, verify model assumptions, select variables, compare models and make inference from model.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Visualize, simulate and analyze data. Emphasize data integrity.
CLO 2. Apply different methods to estimate model parameters
CLO 3. Select an appropriate model and tune regression model to estimate or forecast an interested quantity given observed data of related quantities.

<table><tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr><tr><td>Knowledge</td><td>CLO 1, CLO 2, CLO 3</td></tr><tr><td>Skill</td><td>CLO 1, CLO 2, CLO3</td></tr><tr><td>Attitude</td><td>CLO 1, CLO3</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>Data concepts, collection
Data integrity and quality</td><td>1</td><td>I, U</td></tr>
<tr><td>Types of Convergence
Law of Large Number
Central Limit Theorem</td><td>1</td><td>I, T</td></tr>
<tr><td>Method of Moments</td><td>1</td><td>T, U</td></tr>
<tr><td>Maximum Likelihood Estimation</td><td>2</td><td>T, U</td></tr>
<tr><td>Bayesian Estimation</td><td>3</td><td>T, U</td></tr>
<tr><td>Expectation Maximization Algorithm</td><td>2</td><td>T, U</td></tr>
<tr><td>Linear Regression</td><td>1</td><td>T, U</td></tr>
<tr><td>Logistic Regression</td><td>2</td><td>T, U</td></tr>
<tr><td>Nonparametric method</td><td>2</td><td></td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Short-answer questions, Long-answer questions, programming 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>1. Ronald E. Walpole, Probability & Statistics for Engineers & Scientists 9th Edition, 2013
2. Python for Probability Statistics and Machine Learning, José Unpingco, 3rd Edition, 2022
3. R. Lyman Ott and Michael T. Longnecker, An Introduction to Statistical Methods and Data Analysis 7th Edition, 2015</td></tr>
</table>

2. Learning Outcomes Matrix

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	xx	x				
3	x	xx				xx

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Statistical Method and Data Collection	1		Lecture, Discussion	[3]. Chapter 1, 2
2-3	Data Visualization with Python. Introduction to Data Simulation	1, 2	Exercises	Lecture, In-class exercises	[1]. Chapter 1 [3]. Chapter 3 [2]. Chapter 2.9
4-5	Method of Moments	1, 2	Exercises	Lecture, In-class and Lab exercises Quiz	[2]. Chapter 3.3
6-7	Maximum Likelihood Estimation	1, 2		Lecture, In-class and Lab exercises	[2]. Chapter 3.4
8	**Midterm**				
9-10	Bayesian Estimation	2, 3, 4	Exercises	Lecture, In-class and Lab exercises Quiz	[1]. Chapter 18 [2]. Chapter 3.9
11-12	Expectation maximization algorithm	3	Exercises	Lecture, In-class and Lab exercises Quiz	[2]. Chapter 3.15
13	Linear Regression	3	Exercises	Lecture,	[1]. Chapter 11 [2]. Chapter 3.8

				In-class and exercises	[3]. Chapter 11
14-15	Logistic Regression – a Nonlinear Model	2, 3, 4	Quiz	Lecture, In-class and Lab exercise	[1]. Chapter 12 [2]. Chapter 4.4
16	Nonparametric Method	3, 4	Exercises	Lecture, In-class exercises	[1]. Chapter 16 [2]. Chapter 3.13
17	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Labs (20%)	25%	25%	25%	25%
Midterm examination (30%)	50%	50%		
Projects/Presentations/ Report (10%)			50%	50%
Final examination (40%)		25%	25%	50%

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

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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.↩

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%)			
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,	Issue/ problem to be considered critically is stated, described, and clarified so	Issue/ problem to be considered critically is stated but description	Issue/ problem to be considered critically is stated without

	delivering all relevant information necessary for full understanding.	that understanding is not seriously impeded by omissions.	leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	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	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	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to

	presenting a position.		than one's own (or vice versa).	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,	Delivery techniques (posture,	Delivery techniques (posture, gesture,	Delivery techniques (posture, gesture,

	eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	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,	Central message is clear and consistent with	Central message is basically understandable	Central message can be deduced but is not

	appropriately repeated, memorable, and strongly supported.)	the supporting material.	but is not often repeated and is not memorable.	explicitly stated in the presentation.

Source: Association of American Colleges and Universities

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

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** ☐ Elective
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>- Prerequisites: Students must fulfil ONE of the following requirements to attend this course:
• hold TOEFL iBT certificate with score ≥ 61
• hold IELTS certificate with score ≥ 5.5
• complete IE2 course (for IU program)/ IE3 course (for twinning programs)
- Corequisites: (Course code – Course name): None
- Previous course (Course code – Course name): 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**	**1, 2, 4**			
2	**<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 exam	**[1] p.2-13**
3	**<u>Chapter 2</u> Business Ethics** Recognizing transition expressions Using symbols and abbreviations	**1, 2, 4**	Lecture Group work Individual task	Ongoing assessment Midterm exam	**[1] p.14-25**
4	**<u>Review</u>**	**1, 2, 4**	Lecture Group work Individual task	Ongoing assessment Midterm exam	**Designed by lecturer**
5	**<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 exam	**[1] p.28-39**
6	**<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 exam	**[1] p.40-52**

Week	Topic	CLO	Learning activities	Assessments	Resources
7	**Chapter 5** **The Placebo Effect** Recognizing cause andeffect expressions Noting causes and effects	**1, 2, 4**	Lecture Group work Individual task	Ongoing assessment Midterm exam	**[1] p.54-65**
8	**Sample midterm exam + Correction**	**1, 2, 4**		Ongoing assessment Midterm exam	
MID-TERM EXAMINATION					
9	**Chapter 6 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	**Review**	**1-4**	Lecture Group work Individual task	Ongoing assessment Final exam	**Designed by lecturer**
11	**Chapter 7 Sibling Relationships** Recognizing expressions of comparison and contrast Noting comparison and contrast	**1-4**	Lecture Group work Individual task	Ongoing assessment Final exam	**[1] p.80-91**
12	**Chapter 8 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	**Review**	**1-4**	Lecture Group work Individual task	Ongoing assessment Final exam	**Designed by lecturer**

Week	Topic	CLO	Learning activities	Assessments	Resources
14	**Chapter 9** **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**
15	**Sample final exam + Correction**	**1-4**		Ongoing assessment Final exam	
FINAL EXAMINATION					

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Ongoing assessment (30%)	80% Pass	80% Pass		80% Pass
Midterm exam (30%)	Part 1 80% Pass	Part 2 80% Pass		
Final exam (40%)	Part 1 80% Pass	Part 2 80% Pass	Part 3 80% Pass	

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

5. Rubrics (optional)

5.1. Rubrics for Midterm exam

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.

Date revised: 17 June, 2024

Ho Chi Minh City, 17 June, 2024

Dean of School of Languages

(Signature)

Dr. Nguyễn Huy 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	Students must fulfil ONE of the following requirements to attend this course: • hold TOEFL iBT certificate with score ≥ 61 • hold IELTS certificate with score ≥ 5.5 • complete IE2 course (for IU program)/ IE 3 course (for twinning program)

[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><th>Competency level</th><th>Course learning outcome (CLO)</th></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 rebutal in 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><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>The process of Academic Writing</td><td>1</td><td>I, T, U</td></tr>
<tr><td>Using Outside Sources</td><td>3</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>4</td><td>T, U</td></tr>
<tr><td>Argumentative Essays</td><td>6</td><td>T, U</td></tr>
<tr><td>Summarizing</td><td>2</td><td>U</td></tr>
<tr><td>Review & Correction</td><td>2</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.

Missed Tests
Students are not allowed to miss any of the tests (both Mid-term and Final).</td></tr>
</table>

	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 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 Plagiarism and how to avoid plagiarism	**1, 5**	Lecture Group work Individual writing	Ongoing assessment & Midterm exam	[2] pp. 265-279 [1] pp. 58- 65

Week	Topic	CLO	Learning activities	Assessments	Resources
2	***Using Outside Sources (Cont'd)*** Strategies for writing a successful summary	**5**	Lecture Group work Individual writing	Ongoing assessment & Midterm exam	[1] pp. 58 -72
3 & 4	**Review/ Correction**: Lecturer gives feedback to one or two students' writings in class. **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 exam	[1] pp. 74– 100
5	**Process Essays** Introduction Analyzing the models Thesis statements for process essays Transitional signals	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Midterm exam	[1] pp. 101-115
6	**Process Essays (Cont'd)** **Review/ Correction**: Lecturer gives feedback to one or two students' writings in class. ***<u>In-class Assignment:</u>*** Write a process essay about one of these topics or a topic of the lecturer's choice: • How to cook a favorite food • How to do a favorite hobby • How to succeed in your majorarea or professional field • How to accomplish an academic task (register for classes, apply for a	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Midterm exam	[1] pp. 101-115

Week	Topic	CLO	Learning activities	Assessments	Resources
	scholarship, pass an exam, etc.)				
7	**Cause/ Effect Essays** Introduction Analyzing the models Organization Signal words and phrases	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Midterm exam	[1] pp. 116-132
8	**Cause/ Effect Essays (Cont'd)** **Review/ Correction:** Lecturer gives feedback to one or two students' writings in class. ***In-class Writing:*** Write the introduction, ONE bodyparagraph and the conclusion on one of the two topics left (except for the ones that has been worked on in class and assigned as homework) or a topic of the lecturer's choice: • The cause of obesity • The effects of involvement insports on young children • The causes of stress in collegestudents • The effects of regular reading on students' lives	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Midterm exam	[1] pp. 116 - 132
	MIDTERM EXAMINATION				
9	**Comparison/ Contrast Essays** Introduction Analyzing the models Organization: • Points of comparison • Point-by-point organization • Block organization Comparison and Contrast signal words	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Final exam	[1] pp. 133-151
10	**Comparison/ Contrast Essays (Cont'd)** **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

Week	Topic	CLO	Learning activities	Assessments	Resources
	In-class Assignment: Write a compare and contrast essay on the topic left or a topic ofthe lecturer's choice: • Compare and contrast the relationship between parents and children in two different cultures • Compare and contrast the university cultures in two different countries • Compare and contrast the cultures of a small town and a big city				
10	**Comparison/ Contrast Essays (Cont'd)** Review/ Correction: Lecturer gives feedback to one or two students' writings in class. **In-class Assignment:** Write a compare and contrast essay on the topic left or a topic of the lecturer's choice: • Compare and contrast the relationship between parents and children in two different cultures • Compare and contrast the university cultures in two different countries • Compare and contrast the cultures of a small town and a big city	**2,3,5**	Lecture Group work Individual writing	Ongoing assessment & Final exam	[1] pp. 133-151
11 & 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	**2,3,4,5**	Lecture Group work Individual writing	Ongoing assessment & Final exam	[1] pp. 152-168

Week	Topic	CLO	Learning activities	Assessments	Resources
	• A summary of the opposing arguments • Rebuttals to the opposing arguments • Your own arguments The introductory paragraph: Thesis Statement Statistics as support				
13 & 14	**Argumentative Essays (Cont'd)** **Review/ Correction:** Lecturer gives feedback to one or two students' writings in class. **In-class Writing:** Write an argumentative essay on the topic left or a topic of the lecturer's choice: • Can same-sex parenting negatively influence a child's mentality? • Do famous artists have an innate talent, or do they put in great effort to improve their skills? • Is homework helpful?	**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%)	80% Pass	80% Pass	80% Pass	80% Pass	80% Pass
Midterm exam (30%)	80% Pass	80% Pass	80% Pass		
Final exam (40%)	80% Pass	80% Pass	80% Pass	80% Pass	

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

5. Rubrics (optional)

5.1. Midterm exam 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, punctuation are correct.	**10**	CLO 2
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 arepresented 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 fullyaddressed. 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 aclear 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 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 10 10 10 10	CLO 1,3,4
Total	**100**	

Date revised: 17 June, 2024

Ho Chi Minh City, 17 June, 2024
Dean of School of Languages
(Signature)

Dr. Nguyễn Huy Cường

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: Writing AE1 (EN007IU) and Listening AE1 (EN008IU) - Corequisites: 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>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.</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 effective visual aids in preparing and planning well-organized academic presentations</td></tr>
<tr><td>Skill</td><td>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</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><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Orientation & Introduction
Needs analysis</td><td>2</td><td>I, T, U</td></tr>
<tr><td>Building up confidence</td><td>2</td><td>T, U</td></tr>
<tr><td>The first few minutes</td><td>2</td><td>T, U</td></tr>
<tr><td>Organizing what you want to say</td><td>2</td><td>T, U</td></tr>
<tr><td>Summarizing and concluding</td><td>2</td><td>T, U</td></tr>
<tr><td>Using equipment</td><td>2</td><td>T, U</td></tr>
<tr><td>Delivery techniques: Putting it all together</td><td>2</td><td>T, U</td></tr>
<tr><td>Group presentations for the instructor’s evaluation and advice</td><td>2</td><td>U</td></tr>
<tr><td>Introduction to persuasive speeches</td><td>2</td><td>T, U</td></tr>
<tr><td>Methods of persuasion</td><td>2</td><td>T, U</td></tr>
<tr><td>Maintaining interest</td><td>2</td><td>T, U</td></tr>
<tr><td>Dealing with problems and questions</td><td>2</td><td>T, U</td></tr>
<tr><td>Body language</td><td>2</td><td>T, U</td></tr>
<tr><td>Individual presentations for the instructor’s evaluation and advice</td><td>4</td><td>U</td></tr>
</table></td></tr>
</table>

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 fewexceptions. 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 completehome 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. (2021). *Effective presentations*. Oxford: Oxford University Press [3] Lucas, S. (2019). *The art of public speaking* (13th ed.). New York: McGraw-HillEducation. [4] Harrington, D., & Lebeau, C. (2009). *Speaking of speech*. Macmillan

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	1, 5	Lecture	Ongoing assessment Midterm exam	[1] Presenting, p. 5 [3]* The Art of Public Speaking, Chapter 6 + videos of introductory speeches
2	Building up confidence	2, 5	Lecture, Group work	Ongoing assessment Midterm exam	
3	Introduction to informative speeches Unit 1: The first few minutes	1, 2, 5	Lecture, Group work	Ongoing assessment Midterm exam	[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
4	Unit 3: Organizing what you want to say	1, 2, 5	Lecture, Group work	Ongoing assessment Midterm exam	[1] Presenting, pp. 22-27) [2] Effective Presentations: p.19 + video clip [3]* The Art of Public Speaking, Chapters 8+9
5	Unit 6: Summarizing and concluding	1, 2, 3, 5	Lecture, Group work	Ongoing assessment Midterm exam	[1] Presenting, pp. 40-45 [2] Effective Presentations: p.41 + video clip [3]* The Art of Public Speaking, Chapters 10
6	Unit 2: Using equipment	1, 2, 3, 5	Lecture	Ongoing assessment Midterm exam	[1] Presenting, pp. 14-21) [2] Effective Presentations: p.31 + video clip [3]* The Art of Public Speaking, Chapters 14
7	Delivery techniques: Putting it all together	1, 2, 3, 5	Lecture, Group work	Ongoing assessment Midterm exam	[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
8	Mini individual presentations or group presentations for the instructor's evaluation and advice	1, 2, 3, 5	Group work	Ongoing assessment Midterm exam	
	MIDTERM EXAMINATION				
9	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)
10	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)
11	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)
12	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
13	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
14	Practice	1-5	Group work	Ongoing assessment Final exam	
15	Wrap-up and advice	1-5	Group work	Ongoing assessment Final exam	

4. **Assessment plan**

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Ongoing assessment (30%)	80% Pass	80% Pass	80% Pass	80% Pass	80% Pass
Midterm exam (30%)	Criteria 4-7 80% Pass	Criteria 1-2 80% Pass	Criterion 3 80% Pass		
Final exam (40%)	Criteria 4-6 80% Pass	Criteria 1-2 80% Pass	Criterion 3 80% Pass	Criterion 4 80% Pass	

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

5. Rubrics

5.1. Rubrics for Midterm 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) (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

Date revised: 17 June, 2024

Ho Chi Minh City, 17 June, 2024

Dean of School of Languages

(Signature)

Dr. Nguyễn Huy Cường

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	S **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**	**1, 3**	Lecture Group work Individual task	Ongoing assessment & Midterm exam	[1] pp. 15
2	**<u>Unit 1:</u> The Academic Writing Process (Cont.)** Thinking about writing processes	**1, 3**	Lecture Group work	Ongoing assessment	[1] pp. 15-22

Week	Topic	CLO	Learning activities	Assessments	Resources
	Distinguishing between academic and personal styles of writingGrammar of academic discourse		Individual task	& Midterm exam	
3	**<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 exam	[1] pp. 25-31
4	**<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 exam	[1] pp. 35-44
5	**<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 exam	[1] pp. 45-49
6	**<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 exam	[1] pp. 50-59
7	**<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 exam	[1] pp. 60-68
8	**<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 exam	[1] pp. 69-74
MID-TERM EXAMINATION					
9	**<u>Unit 6:</u> Seeing Ideas and Sharing Texts**	**1, 3**	Lecture	Ongoing assessment	[1] pp. 75-88

Week	Topic	CLO	Learning activities	Assessments	Resources
	Writing about events in time Connecting events Reading and writing about visuals Learning about peer reviews		Group work Individual task	& Final exam	
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%)	80% Pass	80% Pass	80% Pass	80% Pass
Midterm exam (30%)	Part 1 80% Pass		Part 2 80% Pass	
Final exam (40%)		Part 1 80% Pass	Part 2 80% Pass	

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

5. **Rubrics (optional)**

5.1. Rubrics for Midterm exam

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: 17 June, 2024

Ho Chi Minh City, 17 June, 2024
Dean of School of Languages
(Signature)

Dr. Nguyễn Huy Cường

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Introduction to Data Science

Course Code: **IT135IU**

1. General information

Course name	- (in English): Introduction to Data Science - (in Vietnamese): Nhập môn khoa học dữ liệu
Course designation	*This subject will provide a broad introduction to four key aspects of data science: data retrieval and manipulation, data visualization, statistical computation and machine learning, and presentation and communication.*
Course type	☐ *General knowledge* ☑ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	1, 2
Person responsible for the course	Dr. Nguyen, Thi Thanh Sang
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.

<table>
<tr><td>Workload (incl. contact hours, self-study hours)</td><td>(Estimated) Total workload: 127.5 hours
Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours
Private study including examination preparation, specified in hours: 90 hours</td></tr>
<tr><td>Credit points</td><td>3 credits (Theory: 3 + Practice: 0)
4.64 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 0</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>Students will be provided with skills of using data from a variety of sources, be introduced to contemporary computing and database environments, such as R/Python, and be exposed to case studies from outside the classroom. Through this unit, students will become acquainted with the challenges of contemporary data science and gain an appreciation of the foundational skills necessary to turn data into information.</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. Describe what Data Science is and the skill sets needed to be a data scientist.
CLO2. Explain the role of a Data Science Process in data analytics.</td></tr>
<tr><td>Skill</td><td>CLO3. Carry out basic statistical modeling and analysis using open-source data analysis tools.</td></tr>
<tr><td>Attitude</td><td>CLO4. Reason around ethical and privacy issues in data science conduct and apply ethical practices.</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>Introduction to Data Science</td><td>1</td><td>I</td></tr>
<tr><td>Introduction to Descriptive Statistics</td><td>2</td><td>T, U</td></tr>
<tr><td>Hypothesis Testing and Statistical Inference</td><td>1</td><td>T</td></tr>
<tr><td>Exploratory Data Analysis and the Data Science Process</td><td>2</td><td>T, U</td></tr>
<tr><td>Classification 1: Linear & Logistic Regression and K-Nearest Neighbors</td><td>2</td><td>T, U</td></tr>
<tr><td>Classification 2: Decision trees and Support Vector Machine</td><td>2</td><td>T, U</td></tr>
<tr><td>Clustering and Dimensionality Reduction</td><td>1</td><td>T, U</td></tr>
<tr><td>Recommendation Systems</td><td>1</td><td>T, U</td></tr>
<tr><td>Data Visualization</td><td>0.5</td><td>I</td></tr>
<tr><td>Data Science and Ethical Issues</td><td>0.5</td><td>I</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>
<tr><td>Reading list</td><td>[1] Jeffrey M.Stanton, Introduction to Data Science, Syracuse University, 2013.
[2] Cathy O’Neil, Rachel Schutt, Doing Data Science: Straight Talk from the Frontline, O’Reilly Media, 2013.
[3] Joel Grus, Data Science from Scratch: First Principles with Python, O’Reilly Media, 2015.
[4] Jiawei Han, Micheline Kamber, Data Mining: Concepts and Techniques, 3rd Edition, Morgan Kaufmann, 2011.
[5] Matt Harrison, Learning the Pandas Library: Python Tools for Data Munging, Analysis, and Visualization, CreateSpace Independent Publishing Platform, 2016.</td></tr>
</table>

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	xx					
3						x
4				x		

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Data Science	1, 4	Quiz1	Lecture, Discussion, Inclass-Quiz	[1].0. [2].1.
2-3	Introduction to Descriptive Statistics	3	HW1	Lecture, Inclass-Quiz, HW	[1].9.
4	Hypothesis Testing and Statistical Inference	3	Quiz4	Lecture, Group work	[2].2.
5-6	Exploratory Data Analysis and the Data Science Process	2	HW2, Quiz6	Lecture, Group work, HW	[1]. 2, 4 [2]. 2
7			HW2 presentation	Presentation	
8,10	Classification 1: Linear & Logistic Regression and K-Nearest Neighbors	3		Lecture, Group work	[2]. 3
9	Midterm				
11-12	Classification 2: Decision trees and Support Vector Machine	3	HW3	Lecture, Group work, HW	[2]. 4. [1]. 18.
13	Clustering and Dimensionality Reduction	3		Lecture, Group work	[3]. 10

14	Recommendation Systems	3	HW4	Lecture, Discussion, HW	[2]. 8
15	Data Visualization Data Science and Ethical Issues	3,4	Quiz15	Lecture, Inclass-Quiz	[1]. 12, 13 [2]. 9, 16
16	Revision			Review-Test	
17	Final exam				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
In-class exercises/quizzes (10%)	Qz1 60%Pass	Qz6 60%Pass		Qz15 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)

a. 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		

b. 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.

c. 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	Issue/ problem to be considered critically is stated, described, and clarified so that	Issue/ problem to be considered critically is stated but	Issue/ problem to be considered critically is stated without

	comprehensively, delivering all relevant information necessary for full understanding.	understanding is not seriously impeded by omissions.	description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	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	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	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to

	presenting a position.		than one's own (or vice versa).	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	Delivery techniques (posture, gesture, eye contact, and	Delivery techniques (posture, gesture, eye contact, and	Delivery techniques (posture, gesture, eye contact, and vocal

	vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	vocal expressiveness) make the presentation understandable, and speaker appears tentative.	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,	Central message is clear and consistent with	Central message is basically understandable but is not often	Central message can be deduced but is not explicitly stated

	appropriately repeated, memorable, and strongly supported.)	the supporting material.	repeated and is not memorable.	in the presentation.

Source: Association of American Colleges and Universities

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Fundamentals of Programming

Course Code: IT149IU

1. General information

Course name	- (in English): Fundamentals of Programming - (in Vietnamese): Lập trình cơ bản
Course designation	Learning the basics of programming
Course type	☐ *General knowledge* ☑ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	2
Person responsible for the course	Assoc. Prof. Nguyen Thi Thuy Loan, Dr.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1)

	6.18 ECTS
Number of periods	Theory: 45 Practice: 30
Required and recommended prerequisites for joining the course	None
Course objectives	This course concentrates on learning the basics of programming languages which is the foundation for further studies. The course enables students to get familiar with the Python programming language. The course covers all basic Python data structures, control flows, module and introduction to OOP in Python
Course learning outcomes	CLO 1. Understand programming languages and applications, how applications work CLO 2. Able to write applications using Python CLO 3. Understand basic data structure of Python programming

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1
Skill	CLO2, CLO3
Attitude	CLO3

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 Programming Language	3	I
Introduction to Python Programming	3	I, T
Data Types and Variables in Python	3	T, U
Numbers and Operators in Python	3	T, U
Control Flow: Branching Statements	3	T, U
Control Flow: Loops	3	T, U
Lists in Python	3	T, U
Tuples in Python	3	T, U
Sets in Python	3	T, U

		Functions	3	T, U
		Modules	3	T, U
		File Handling	3	T, U
		Exception Handling	3	T, U
		Object and Classes in Python	3	T, U
		Inheritance and Polymorphism	3	T, U
Examination forms	Multiple-choice questions, 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	Eric Matthes, Python Crash Course: A Hands-On, Project-Based Introduction to Programming, 2nd Edition, No Starch Press, 2019			

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:

CLO\SLOT	1	2	3	4	5	6
1	x					
2		xx				
3		xx				

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Programming Language	1	Quiz	Lecture	1
2	Introduction to Python Programming	1	Quiz	Lecture	1
3	Data Types and Variables in Python	1	Quiz	Lecture	1
4	Numbers and Operators in Python	2, 3	Quiz, Lab, Midterm	Lecture, Discussion,	1

				In-class Exercise	
5	Control Flow: Branching Statements	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
6	Control Flow: Loops	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
7	Lists in Python	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
8	Tuples in Python	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
Midterm					
9	Sets in Python	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
10	Functions	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
11	Modules	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
12	File Handling	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1

13	Exception Handling	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
14	Object and Classes in Python	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
15	Inheritance and Polymorphism	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
Final					

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Quiz / Assignment (10%)	50%	10%	10%
Labs (20%)	10%	30%	30%
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	10%	30%	30%

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

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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.↩

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	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed	Conclusion is logically tied to a range of information, including opposing	Conclusion is logically tied to information (because information is chosen to fit the	Conclusion is inconsistently tied to some of the information discussed;

consequences)	evaluation and ability to place evidence and perspectives discussed in priority order.	viewpoints; related outcomes (consequences and implications) are identified clearly.	desired conclusion); some related outcomes (consequences and implications) are identified clearly.	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	Language choices are thoughtful and generally support the	Language choices are mundane and commonplace and partially	Language choices are unclear and minimally support the effectiveness of

	enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	effectiveness of the presentation. Language in presentation is appropriate to audience.	support the effectiveness of the presentation. Language in presentation is appropriate to audience.	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 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

	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Object-Oriented Programming

Course Code: IT069IU

1. General information

Course name	- (in English): Object-Oriented Programming - (in Vietnamese): Lập trình hướng đối tượng
Course designation	This subject introduces students to the object-oriented programming from basic notions to professional principles for designing an object-oriented software.
Course type	☐ *General knowledge* ☑ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	3
Person responsible for the course	Dr. Tran Thanh Tung
Language	English
Relation to curriculum	Compulsory (all programs)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours

<table>
<tr><td></td><td>Private study including examination preparation, specified in hours: 120 hours</td></tr>
<tr><td>Credit points</td><td>4 credits (Theory: 3 + Practice: 1)
6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Prerequisite course of OOP: Fundamentals of Programming</td></tr>
<tr><td>Course objectives</td><td>Introduction to object-oriented programming and design. Topics include core terminologies and basic design principles of object-oriented programming such as classes, objects, abstraction, encapsulation, inheritance, polymorphism, the SOLID design principles, and design patterns</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Explain and use concepts in object-oriented programming including classes, objects, abstraction, encapsulation, inheritance, and polymorphism.
CLO 2. Implement an object-oriented solution in JAVA programming language.
CLO 3. Analyze design principles and design patterns in object-oriented programing

<table><tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr><tr><td>Knowledge</td><td>CLO1</td></tr><tr><td>Skill</td><td>CLO2, CLO3</td></tr><tr><td>Attitude</td><td>CLO2</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 Java</td><td>3</td><td>I</td></tr><tr><td>Introduction to Object-Oriented Programming</td><td>3</td><td>I, T</td></tr></table></td></tr>
</table>

		Classes and Objects	3	T	
		Inheritance and composition	3	T	
		Polymorphism	3	T	
		Design with interfaces and abstract classes	3	T	
		Building Objects	3	T	
		Exception handling	3	T	
		Generic classes and methods	3	T	
		Introduction to SOLID principles Single responsibility principle	3	T, U	
		Open/closed principle	1.5	T, U	
		Lisko substitution principle	1.5	T, U	
		Interface segregation principle	1.5	T, U	
		Dependency inversion principle	1.5	T, U	
		Reusing Designs Through Design Patterns	6	T, U	
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. Paul J. Deitel (Author), Harvey Deitel (Author), Java How To Program, 11th Edition, Prentice Hall, 2017 2. Matt Weisfeld, The Object-Oriented Thought Process, 3rd Edition, Addison-Wesley, 2009 3. Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides, Design Patterns: Elements of Reusable Object-Oriented Software, Addison-Wesley Professional, 1994 4. Eric Freeman, Bert Bates, Kathy Sierra and Elisabeth Robson, Head First Design Patterns: A Brain-Friendly Guide, O'Reilly Media, 2004				

2. Learning Outcomes Matrix

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	xx					
2		xx				x
3		xxx				x

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Java	1	Quiz	Lecture	[1]
2	Introduction to Object-Oriented Programming	1	Quiz	Lecture, Discussion	[1,2]
3	Classes and Objects	2	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
4	Inheritance and composition	2	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
5	Polymorphism	2	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
6	Design with interfaces and abstract classes	2,3	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
7	Building Objects	2,3	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
8	Exception handling	1,2	Quiz	Lecture	[1]

9	**Midterm**				
10	Generic classes and methods	2,3	Quiz, Lab, Final	Lecture, Discussion, In-class exercises	[1,2]
11	Introduction to SOLID principles Single responsibility principle	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
12	Open/closed principle Lisko substitution principle	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
13	Interface segregation principle Dependency inversion principle	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
14	Reusing Designs Through Design Patterns, part 1	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
15	Reusing Designs Through Design Patterns, part 2	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
16	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Quiz (5%)	10%		20%
Labs (10%)	30%	30%	
Midterm examination (30%)	50%	40%	
Projects/Presentations/ Report (15%)	10%		30%
Final examination (40%)		30%	50%

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	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed	Conclusion is logically tied to a range of information, including opposing	Conclusion is logically tied to information (because information is chosen to fit the	Conclusion is inconsistently tied to some of the information discussed;

consequences)	evaluation and ability to place evidence and perspectives discussed in priority order.	viewpoints; related outcomes (consequences and implications) are identified clearly.	desired conclusion); some related outcomes (consequences and implications) are identified clearly.	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	Language choices are thoughtful and generally support the	Language choices are mundane and commonplace and partially	Language choices are unclear and minimally support the effectiveness of

	enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	effectiveness of the presentation. Language in presentation is appropriate to audience.	support the effectiveness of the presentation. Language in presentation is appropriate to audience.	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 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

	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Data Structures and Algorithms

Course Code: IT013IU

1. General information

Course name	- (in English): Data Structures and Algorithms - (in Vietnamese): Cấu trúc dữ liệu và giải thuật
Course designation	This subject introduces students to basic data structures and algorithms
Semester(s) in which the course is taught	4,6
Course type	☐ *General knowledge* ☑ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Person responsible for the course	Dr. Tran Thanh Tung
Language	English
Relation to curriculum	Compulsory (All programs)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1)

<table>
<tr><td></td><td>6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Object-Oriented Programming</td></tr>
<tr><td>Course objectives</td><td>Introduction to data structures and algorithms, including their design, analysis, and implementation.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Understand basic data structures and algorithms
CLO 2. Analyze and evaluate data structures and algorithms.
CLO 3. Design algorithms and select data structures for real world applications.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1</td></tr>
<tr><td>Skill</td><td>CLO2, CLO3</td></tr>
<tr><td>Attitude</td><td>CLO3</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>Review OOP & Java</td><td>3</td><td>I</td></tr>
<tr><td>Arrays</td><td>3</td><td>T</td></tr>
<tr><td>Complexity</td><td>3</td><td>T</td></tr>
<tr><td>Sorting</td><td>3</td><td>T, U</td></tr>
<tr><td>Queue, Stack</td><td>3</td><td>T</td></tr>
<tr><td>List</td><td>6</td><td>T</td></tr>
<tr><td>Recursion</td><td>3</td><td>T, U</td></tr>
<tr><td>Advanced Sorting</td><td>6</td><td>T</td></tr>
<tr><td>Binary Tree</td><td>3</td><td>T</td></tr>
<tr><td>Hash Table</td><td>3</td><td>T</td></tr>
<tr><td>Graphs</td><td>3</td><td>T</td></tr>
<tr><td>Algorithms on graphs</td><td>3</td><td>T, U</td></tr>
</table></td></tr>
</table>

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. Michael T. Goodrich and Roberto Tamassia, Data Structures and Algorithms in Java 6th, 2014 2. Cormen, Thomas H., et al. Introduction to algorithms. MIT press, 2009. 3. Lafore, Robert. Data structures and algorithms in Java. Sams publishing, 2017.

2. Learning Outcomes Matrix

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	XX					
2		XXX				
3						X

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Review OOP & Java	1	Quiz	Lecture	
2	Arrays	1	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
3	Complexity	2	Quiz	Lecture, Discussion	[2]
4	Sorting	1,2	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
5	Queue, Stack	2,3	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
6	List part 1	1,2	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]

7	List part 2	2,3	Lab, Quiz, Midterm	Lecture, Discussion	
8	Recursion	2,3	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
9	**Midterm**				
10	Advanced Sorting part 1	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[1,3]
11	Advanced Sorting part 2	2,3	Lab, Quiz, Final	Lecture, Discussion	[1,2,3]
12	Binary Tree	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[1,3]
13	Hash Table	2,3	Lab, Quiz, Final	Lecture, Discussion	[1,3]
14	Graphs	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[2,3]
15	Algorithms on graphs	2,3	Lab, Quiz, Final	Lecture, Discussion	[2,3]
16	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Quiz (5%)	20%	5%	
Labs (10%)		10%	
Midterm examination (30%)	40%	30%	30%
Projects/Presentations/ Report (15%)		15%	40%
Final examination (40%)	40%	40%	30%

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

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	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed	Conclusion is logically tied to a range of information, including opposing	Conclusion is logically tied to information (because information is chosen to fit the	Conclusion is inconsistently tied to some of the information discussed;

consequences)	evaluation and ability to place evidence and perspectives discussed in priority order.	viewpoints; related outcomes (consequences and implications) are identified clearly.	desired conclusion); some related outcomes (consequences and implications) are identified clearly.	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	Language choices are thoughtful and generally support the	Language choices are mundane and commonplace and partially	Language choices are unclear and minimally support the effectiveness of

	enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	effectiveness of the presentation. Language in presentation is appropriate to audience.	support the effectiveness of the presentation. Language in presentation is appropriate to audience.	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 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

	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Principles of Database Management

Course Code: IT079IU

1. General information

Course name	- (in English): Principles of Database Management - (in Vietnamese): Nguyên tắc của quản trị cơ sở dữ liệu
Course designation	This subject introduces students to learn how to design database and normalization
Course type	☐ *General knowledge* ☑ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	4,6
Person responsible for the course	Assoc. Prof. Dr. Nguyen Thi Thuy Loan
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS

<table>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Fundamentals of Programming</td></tr>
<tr><td>Course objectives</td><td>This subject introduces the students to basic database design and implementation concepts. Database design techniques, including relational design and E-R analysis, are presented. Database queries using SQL are covered in lectures and supported by practical exercises.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Produce an (Extended) Entity-Relationship (E-R) model from specifications.
CLO 2. Apply data normalization principles to transforming an ER model into a database schema.
CLO 3. Construct efficient SQL queries to retrieve and manipulate data as required.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1</td></tr>
<tr><td>Skill</td><td>CLO2, CLO3</td></tr>
<tr><td>Attitude</td><td>CLO3</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 (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 Database Systems</td><td>3</td><td>I</td></tr>
<tr><td>Relational Model and Relational Algebra</td><td>6</td><td>T, U</td></tr>
<tr><td>Structured Query Language</td><td>6</td><td>T, U</td></tr>
<tr><td>(Extended) Entity Relationship Model</td><td>6</td><td>T, U</td></tr>
<tr><td>Relational Database Design</td><td>9</td><td>T, U</td></tr>
<tr><td>Normalization</td><td>6</td><td>T, U</td></tr>
<tr><td>Advanced SQL</td><td>6</td><td>T, U</td></tr>
<tr><td>Review</td><td>3</td><td>I, U</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Multiple-choice questions, short-answer questions</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. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concept 7th, 2020 2. Jeffrey A. Hoffer, Ramesh Venkataraman, Heikki Topi, Modern Database Management 13th, 2019 3. Ramez Elmasri, Shamkant Navathe, Fundamentals of Database Systems 7th, 2016

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	XXX					
2		XXX			X	
3		XX			XX	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Database Systems	1	Quiz	Lecture	[1,3]
2	Relational Model and relational Algebra	2	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,3]
3	Structured Query Language	3	Quiz, Lab, Project, Midterm	Lecture, Discussion, In-class, exercise	[1,2,3]
4	(Extended) Entity Relationship Model	2	Quiz, Project, Midterm	Lecture, Discussion, In-class, exercise	[1,2,3]
5	**Midterm**				

6	Relational Database Design	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1,2]
7	Normalization	2,3	Quiz, Project, Final	Lecture, Discussion, In-class, exercise	[2,3]
8	Advanced SQL	3	Quiz, Project, Final	Lecture, Discussion, In-class, exercise	[1,3]
9	Review	2,3	Quiz	Discussion, In-class, exercise	[1,2,3]
10	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Labs (10%)		10%	20%
Midterm examination (25%)	40%		20%
Quiz (5%)	10%	20%	
Projects/Presentations/ Report (20%)	30%	20%	30%
Final examination (40%)	20%	50%	30%

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

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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.↩

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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable	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.

	makes the content of the presentation cohesive.	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 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.

	polished and confident.			
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	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is	Central message can be deduced but is not explicitly stated in the presentation.

	repeated, memorable, and strongly supported.)		not memorable.	

Source: Association of American Colleges and Universities

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS
Course Name: Artificial Intelligence
Course Code: IT159IU

1. General information

Course name	- (in English): Artificial Intelligence - (in Vietnamese): Trí tuệ nhân tạo
Course designation	This subject introduces the students to the principles and fundamental algorithms of Artificial Intelligence, the use cases and the related processes in Artificial Intelligence.
Course type	☐ *General knowledge* ☑ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	6,8
Person responsible for the course	Nguyen Trung Ky, Dr.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, laboratory.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours

<table>
<tr><td>Credit points</td><td>4 credits (Theory: 3 + Practice: 1)
6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Data Structures and Algorithms
Probability, Statistic & Random Process</td></tr>
<tr><td>Course objectives</td><td>This course introduces students to the basic knowledge on Artificial Intelligence. Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. In this course, student will learn the foundational principles and practice implementing some of these applications including representation, problem solving, and learning methods of artificial intelligence. Accordingly, students should be able to develop intelligent systems by assembling solutions to concrete computational problems; understand the role of knowledge representation, problem solving, and learning in intelligent-system engineering; and appreciate the role of problem solving, vision, and language in understanding human intelligence from a computational perspective.</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>CLO 1. Apply knowledge of AI techniques and synthesize solutions to the discipline and ability to develop a range of typical applications using artificial intelligence methods
CLO 2. Represent knowledge corresponding to practical problems, design, implement, and evaluate a computer-based system, process, component, or program to</td></tr>
</table>
</td></tr>
</table>

			meet desired needs by properly using classical search algorithms, including breadth-first, depth-first, A*, and heuristic search	
		Skill	CLO 3. Produce intelligent applications of machine learning with statistical learning methods (Naive Bayes), supervised and unsupervised learning models: decision tree, neural networks, single-layer (perceptron) and multilayer networks CLO 4. Communicate effectively with a range of audiences, ability to use current techniques, skills, and tools necessary for computing practice, ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices and ability to apply design and development principles in the construction of software systems of varying complexity	
		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 and Intelligent Agents	1	I

	States and Searching: Uninformed Search	1	T, U
	States and Searching: Informed and More Sophisticated Search	1	T, U
	Features and Constraints: Constraint Satisfaction Problems	1	T, U
	Features and Constraints: Constraint Satisfaction Problems (continue)	1	T, U
	Reasoning Under Uncertainty: ▪ Random Variables and Events ▪ Joint and Marginal Distributions ▪ Conditional Distribution ▪ Product Rule, Chain Rule, Bayes' Rule ▪ Inference	1	T, U
	Reasoning Under Uncertainty: Naïve Bayes Classifier (continue)	1	T, U
	Supervised Learning: Neural Networks	1	T, U
	Supervised Learning: Neural Networks (continue)	1	T, U
	Supervised Learning: Support Vector Machine	1	T, U
	Supervised Learning: Support Vector Machine in Mathematics	1	T, U
	Beyond Supervised Learning: Kernels and Clustering	1	T, U
	Beyond Supervised Learning: Kernels and Clustering (continue)	1	T, U
	Gaussian Mixture Model and Expectation-Maximization Algorithm	1	T, U
	Revision	1	

Examination forms	Multiple-choice questions, 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] Stuart Russell and Peter Norvig, *"Artificial Intelligence: A Moder*

	Approach", Fourth Edition, 2020. [2] David L. Poole and Alan K. Mackworth, *"Artificial Intelligence Foundations of Computational Agents"*, Second Edition, 2017.

2. Learning Outcomes Matrix

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
4	x	x				x

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction and Intelligent Agents	1, 2	Quiz	Lecture, Discussion	[1]. Chapter 1, 2 [2]. Chapter 1
2	States and Searching: Graph Searching Techniques	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 3
3	States and Searching: Heuristic Search and More Sophisticated Search	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 3
4	Features and Constraints: Constraint Satisfaction Problems	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 6
5	Features and Constraints: Constraint Satisfaction Problems (continue)	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 6
6	Reasoning Under Uncertainty	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 12
7	Reasoning Under Uncertainty (continue)	3, 4	Quiz	Lecture, In-class quiz	1]. Chapter 12
8	**Midterm**				
9	Supervised Learning: Neural Networks	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 19 [2]. Chapter 20

10	Supervised Learning: Neural Networks (continue)	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 19 [2]. Chapter 20
11	Supervised Learning: Support Vector Machine	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 19 [2]. Chapter 15
12	Supervised Learning: Support Vector Machine in Mathematics (continue)	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 19 [2]. Chapter 15
13	Beyond Supervised Learning: Kernels and Clustering	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 21 [2]. Chapter 16, 22
14	Beyond Supervised Learning: Kernels and Clustering (continue)	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 21 [2]. Chapter 16, 22
15	Gaussian Mixture Model and Expectation-Maximization Algorithm	3, 4	Quiz	Lecture, Discussion	[1]. Chapter 20 [2]. Chapter 24
16	Revision			Review-test	
17	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Labs (20%)		50%	50%
Midterm examination (30%)	50%	50%	
Final examination (40%)		100%	
Exercises/ Quiz (10%)	50%	50%	

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

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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.↩

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	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed	Conclusion is logically tied to a range of information, including opposing	Conclusion is logically tied to information (because information is chosen to fit the	Conclusion is inconsistently tied to some of the information discussed;

consequences)	evaluation and ability to place evidence and perspectives discussed in priority order.	viewpoints; related outcomes (consequences and implications) are identified clearly.	desired conclusion); some related outcomes (consequences and implications) are identified clearly.	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	Language choices are thoughtful and generally support the	Language choices are mundane and commonplace and partially	Language choices are unclear and minimally support the effectiveness of

	enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	effectiveness of the presentation. Language in presentation is appropriate to audience.	support the effectiveness of the presentation. Language in presentation is appropriate to audience.	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 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

	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Fundamental Concepts of Data Security

Course Code: IT140IU

1. General information

Course name	- (in English): Fundamental Concepts of Data Security - (in Vietnamese): Khái niệm cơ bản về bảo mật dữ liệu
Course designation	Fundamental concept of data security: This course focuses on information security, integrity and privacy techniques.
Course type	☐ *General knowledge* ☑ *Fundamental* ☐ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	5,7
Person responsible for the course	Le Thanh Son, MSc.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1)

<table>
<tr><td></td><td>6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>This course introduces students to cryptographic principals and systems (symmetric and public key encryptions), and their applications in data security, secure communications, authentication and authorization. These core principles will be applied to the concepts of information risk management, and the analysis and handling of compromised systems. The ethics around computer crime, privacy, and intellectual property are covered in detail. Finally, the unit will cover the criteria and controls for information classification.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Gain understanding of the cryptography concepts including symmetric key encryption, hash function, message authentication code, public key encryption, digital signature and digital envelope;
CLO 2. Apply the concepts of authentication and authorization in implementing secure systems and networks;
CLO 3. Understand and categorize the malicious software and their attacking mechanisms;
CLO 4. Explore the buffer overflow attacks and fuzzing to find software vulnerabilities, and obtain the knowledge of software and operating system security;
CLO 5. Understand and practice Internet security protocols and authentication applications;
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1, CLO2, CLO3, CLO5</td></tr>
<tr><td>Skill</td><td>CLO4</td></tr>
<tr><td>Attitude</td><td></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.</td></tr>
</table>

<table>
<tr><td></td><td>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>Symmetric-key encipherment (AES, DES)</td><td>2</td><td>T,U</td></tr>
<tr><td>Asymmetric-key encipherment (RSA, Diffie-Hellman,…);</td><td>2</td><td>T,U</td></tr>
<tr><td>Message integrity and message authentication;</td><td>2</td><td>T,U</td></tr>
<tr><td>Cryptographic hash function;</td><td>1</td><td>T,U</td></tr>
<tr><td>Digital signature;</td><td>1</td><td>T,U</td></tr>
<tr><td>Entity authentication;</td><td>1</td><td>T,U</td></tr>
<tr><td>Security at the application layer: PGP and S/MINE;</td><td>1</td><td>T</td></tr>
<tr><td>Security at the transport layer: SSL and TLS;</td><td>1</td><td>T</td></tr>
<tr><td>Security at network layer: IPSec;</td><td>1</td><td>T</td></tr>
<tr><td>Malicious software;</td><td>2</td><td>T</td></tr>
<tr><td>Database and cloud security;</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>
<tr><td>Reading list</td><td>1. William Stallings, Cryptography and Network Security 7th, 2016</td></tr>
</table>

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-5) 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	X		
2		X				
3	X					

4	X					
5	X					

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Symmetric-key encipherment (AES, DES)	1	Quiz, exam	Lecture, exercises, lab	[1]
2	Asymmetric-key encipherment (RSA, Diffie-Hellman,…);	1	Quiz, exam	Lecture, exercises, lab	[1]
3	Message integrity and message authentication;	1,2	Quiz, exam	Lecture, exercises, lab	[1]
4	Cryptographic hash function;	1	Quiz, exam	Lecture, exercises, lab	[1]
5	Digital signature;	1	Quiz, exam	Lecture, exercises, lab	[1]
6	**Midterm**				
7	Entity authentication;	2	Quiz, exam	Lecture, exercises, lab	[1]
8	Security at the application layer: PGP and S/MINE;	5	Quiz, exam	Lecture, exercises	[1]
9	Security at the transport layer: SSL and TLS;	5	Quiz, exam	Lecture, exercises	[1]
10	Security at network layer: IPSec;	5	Quiz, exam	Lecture, exercises	[1]
11	Malicious software;	3,4	Quiz, exam	Lecture, exercises, lab	[1]
12	Database and cloud security;	3,4	Quiz, exam	Lecture, exercises, lab	[1]

13	**Final exam**				

4. Assessment plan

Assessment Type	**CLO 1**	**CLO 2**	**CLO 3**	**CLO 4**	**CLO 5**
Midterm examination (30%)	68%	70%	55%		
Final examination (40%)				74%	67%
Exercises/ Quiz (30%)	32%	30%	45%	26%	33%

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

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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.↩

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	Issue/ problem to be considered critically is stated without clarification or description.

			undetermined, and/ or backgrounds unknown.	
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)	Delivery techniques (posture, gesture, eye contact, and vocal	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness)	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness)

	make the presentation compelling, and speaker appears polished and confident.	expressiveness) make the presentation interesting, and speaker appears comfortable.	make the presentation understandable, and speaker appears tentative.	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	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.

	strongly supported.)			

Source: Association of American Colleges and Universities

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Data Analysis

Course Code: IT137IU

1. General information

Course name	- (In English): Data Analysis - (In Vietnamese): Phân tích dữ liệu
Course designation	Data analysis is a process of inspecting, cleansing, transforming, and modelling data with the goal of discovering useful information, informing conclusions, and supporting decision-making.
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	3,5
Person responsible for the course	Nguyen Thi Thanh Sang, Dr.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours

<table>
<tr><td>Credit points</td><td>4 credits (Theory: 3 + Practice: 1)
6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Statistical Method</td></tr>
<tr><td>Course objectives</td><td>This course introduces fundamentals of data analysis by learning data analysis process together with descriptive statistics and inferential statistics. Students will study how to collect data, process and turn them into useful information and knowledge which are important to decision making. From raw data to useful information then to knowledge, students will examine a number of datasets and case studies from different perspectives. Students are able to develop practical solutions to problems in business and engineering, and gain hands-on experience of using contemporary data analysis tools.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Understand fundamental concepts of data analysis.
CLO 2. Explain how to perform data analysis with descriptive statistics and inferential statistics.
CLO 3. Apply data analysis techniques and tools to some practical cases in business/engineering.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1</td></tr>
<tr><td>Skill</td><td>CLO2, CLO3</td></tr>
<tr><td>Attitude</td><td>CLO3</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>Data, data analysis process and business decisions</td><td>1</td><td>T, U</td></tr>
<tr><td>Data analysis roles</td><td>1</td><td>T, U</td></tr>
</table></td></tr>
</table>

	Data Ecosytem and Languages for Data Professionals	2	T, U
	Data Repositories and Big data Platforms	2	T, U, I
	Gathering Data	1	T, U, I
	Wrangling Data	1	T, U
	Analyzing and Data Mining	1	T, U
	Communication Data Analysis Finding	1	I
	Exploratory Data Analysis	1	T, U, I
	Customer relationship management	2	T, U, I
	Personalization	1	
Examination forms	Multiple-choice questions, 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. Anil Maheshwari, Data Analytics, 2022 2. Migrant & Seasonal Head Start Technical Asistance Center. Introduction to Data Analysis Handbook, non-commercial ues only.		

2. Learning Outcomes Matrix (optional)

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

	SLO					
CLO	1	2	3	4	5	6
1	XX					
2	X				X	
3						X

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Data, data analysis process and business decisions	1	Quiz	Lecture	[1,2]

Week	Topic	CLO	Assessments	Learning activities	Resources
2	Data analysis roles	2	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,2]
3	Data Ecosytem and Languages for Data Professionals	2	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,2]
4	Data Repositories and Big data Platforms	2	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,2]
5	Gathering Data	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1]
6	**Midterm**				
7	Wrangling Data	2	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1]
8	Analyzing and Data Mining	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1,2]
9	Communication Data Analysis Finding	3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1,2]
10	Exploratory Data Analysis	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1,2]
11	Customer relationship management	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1]
12	Personalization	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1]
13	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (10%)			100%
Midterm examination (25%)	50%	50%	
Final examination (40%)		50%	50%
Exercises/ Quiz (5%)	100%		
Projects/Presentations/ Report (20%)	30%	30%	40%

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

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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.↩

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	Issue/ problem to be considered critically is stated without clarification or description.

			backgrounds unknown.	
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	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

			(or vice versa).	
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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications)	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications)

	perspectives discussed in priority order.	are identified clearly.	(consequences and implications) are identified clearly.	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	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

		appropriate to audience.	presentation is appropriate to audience.	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	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or	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

		establishes the presenter's credibility/ authority on the topic.	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Regression Analysis

Course Code: IT136IU

1. General information

Course name	- (in English): Regression Analysis - (in Vietnamese): Phân tích hồi qui
Course designation	This course covers linear regressions, inference and diagnostic for linear regression models, model selection and transformation.
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	2,4
Person responsible for the course	Assoc. Prof. Vo Thi Luu Phuong, Ph.D.
Language	English
Relation to curriculum	Compulsory, Data Science major
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1)

<table>
<tr><td></td><td>6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>Regression analysis is one of the most powerful methods in statistics for determining the relationships between variables and using these relationships to forecast future observations. The foundation of regression analysis is very helpful for any modeling exercise. Regression models are used to predict and forecast future outcomes. Its popularity in finance is very high; it is also very popular in other disciplines like life and biological sciences, management, engineering, etc.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Determine the models representing the relationships between variables and use the models to forecast future observations.
CLO 2. Perform inference and diagnostic of the models; select the best model.
CLO 3. Apply knowledge to various practical datasets.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1</td></tr>
<tr><td>Skill</td><td>CLO2, CLO3</td></tr>
<tr><td>Attitude</td><td>CLO2</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 (hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight (Theory + Lab.)</th><th>Level</th></tr>
<tr><td>Basic of probabilities and statistics</td><td>6</td><td>T, U</td></tr>
<tr><td>Some tips on R, Python</td><td>3</td><td>U</td></tr>
<tr><td>Simple Linear Regression</td><td>3</td><td>T, U</td></tr>
<tr><td>Simple Linear Regression: inferences and diagnostics</td><td>6+4</td><td>T, U</td></tr>
</table></td></tr>
</table>

	Matrix approach for Simple regression model	3+4	T, U
	Multiple Linear Regression	6+4	T, U
	Selecting the best regression model	3+4	T, U
	Multiple Linear Regression: Diagnostic	3+4	T, U
	Transformations	3	T, U
	Logistic regression	3+4	T, U
	Autocorrelation in Time series data	3	T, U
	Final review	3+2	T
Examination forms	Multiple-choice questions, short-answer questions, programming		
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. Michael H. Kutner, Christopher J Nachtsheim, John Neter, Applied Linear Regression Models, 4th, 2004 2. Montgomery, D. C., Peck, E. A., and Vining, G., Introduction to Linear Regression Analysis, 5th, 2012		

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	xxx	xx				
2	xxx	xx				
3						xx

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Basic of probabilities and statistics	1, 2	Quiz	Lecture, discussion, in-class exercise	1,2

2	Some tips on R, Python	1, 2		Lecture, discussion, in-class exercise	1,2
3	Simple Linear Regression	1, 2	Midterm	Lecture, discussion, in-class exercise, laboratory	1,2
4-5	Simple Linear Regression: inferences and diagnostics	1, 2, 3	Quiz, Midterm, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
6	Matrix approach for Simple regression model	1, 2	Midterm	Lecture, discussion, in-class exercise, laboratory	1,2
7-8	Multiple Linear Regression	1, 2, 3	Quiz, Midterm, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
	Midterm Exam				
8	Selecting the best regression model	2, 3	Final, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
9-10	Multiple Linear Regression: Diagnostic	2, 3	Quiz, Final, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
11	Transformations	2, 3	Final, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
12-13	Logistic regression	1, 2, 3	Quiz, Final, Lab, Homework	Lecture, discussion, in-class	1,2

				exercise, laboratory	
14	Autocorrelation in Time series data	2, 3	Final, Homework	Lecture, discussion, in-class exercise	1,2
15	Final review	1, 2, 3	Final, Homework	Lecture, discussion	1,2
	Final exam				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Quiz, homework (10%)	25%	25%	
Labs (25%)	25%	25%	50%
Midterm examination (30%)	25%	25%	25%
Final examination (35%)	25%	25%	25%

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

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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.↩

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	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously	Issue/ problem to be considered critically is stated but description leaves some terms	Issue/ problem to be considered critically is stated without clarification or description.

	information necessary for full understanding.	impeded by omissions.	undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	
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	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'	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some

	presenting a position.		assumptions than one's own (or vice versa).	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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications)	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications)

	discussed in priority order.	are identified clearly.	and implications) are identified clearly.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Data Science and Data Visualization

Course Code: IT138IU

1. General information

Course name	- (In English): Data Science and Data Visualization - (In Vietnamese): Khoa học dữ liệu và Trực quan hóa dữ liệu
Course designation	Introduction to Data Visualization
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	4,6
Person responsible for the course	Tran Thanh Tung, Dr.
Language	English
Relation to curriculum	Compulsory / elective / specialisation Names of other study programmes with which the module is shared
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS

<table>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>The goal of this course is to introduce students to the key principles, methods, and techniques for effective visual analysis of data. The course begins with aims and key principles of data visualization. The course continues with different aspects of visualization including techniques and method for presenting different data types, and for discussing and analyzing visualizations. Thorough the course, students will be introduced to many visualization systems and visual tools via hand-on exercises.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Understand the principles of data and graphic design.
CLO 2. Create well-designed data visualizations with appropriate tools.
CLO 3. Evaluate a visualization design.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1</td></tr>
<tr><td>Skill</td><td>CLO2, CLO3</td></tr>
<tr><td>Attitude</td><td>CLO3</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>Visualization design principles</td><td>3</td><td>I, T</td></tr>
<tr><td>Perception, Cognition, Color</td><td>3</td><td>T</td></tr>
<tr><td>Data abstraction, data types</td><td>3</td><td>I, T</td></tr>
<tr><td>Visual encoding with marks and channels</td><td>3</td><td>T, U</td></tr>
<tr><td>Tasks and Interactivity</td><td>3</td><td>T</td></tr>
<tr><td>Validation and visualization</td><td>3</td><td>T</td></tr>
<tr><td>Arrange text and sets</td><td>3</td><td>T</td></tr>
<tr><td>Arrange spatial data</td><td>3</td><td>T</td></tr>
<tr><td>Arrange tree and graphs/networks</td><td>3</td><td>T</td></tr>
</table></td></tr>
</table>

		Facets and views	3	T	
		Focus+Context	3	T	
		Filtering and Aggregation	3	T	
Examination forms	Multiple-choice questions, 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] Edward R. Tufte, The Visual Display of Quantitative Information 2nd, 2001 [2] Tamara Munzner, Visualization Analysis and Design 1st, 2014 [3] Colin Ware, Visual Thinking for Design 1st, 2004 [4] Scott Murray, Interactive Data Visualization for the Web 1st, 2013 [5] Alberto Cairo, The Functional Art: An introduction to information graphics and visualization 1st, 2012 [6] Cole Nussbaumer Knaflic, Storytelling with Data: A Data Visualization Guide for Business Professionals 1st, 2015				

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				

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Visualization design principles	1	Quiz	Teaching, presentation	
2	Perception, Cognition, Color	1,2	Quiz, Project	Teaching, presentation	

Week	Topic	CLO	Assessments	Learning activities	Resources
3	Data abstraction, data types	2,3	Quiz, Project	Teaching, presentation	
4	Visual encoding with marks and channels	2,3	Quiz, Project	Teaching, presentation	
5	Tasks and Interactivity	2,3	Quiz, Project	Teaching, presentation	
6	**Midterm**				
7	Validation and visualization	1,3	Quiz, in-class exercises, Project	Teaching, Discussion	
8	Arrange text and sets	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
9	Arrange spatial data	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
10	Arrange tree and graphs/networks	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
11	Facets and views	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
12	Focus+Context	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
13	Filtering and Aggregation	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
14	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (20%)		x	x
Midterm examination (30%)	x	x	
Final examination (40%)		x	x
Exercises/ Quiz (10%)	x	x	

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

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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.↩

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	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

	experts are questioned thoroughly.	subject to questioning.	Viewpoints of experts are taken as 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	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.

	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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable

	transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	transitions) is clearly and consistently observable within the presentation.	transitions) is intermittently observable within the presentation.	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	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable , and speaker	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandabilit y of the presentation, and

	polished and confident.	appears comfortable.	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,	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is	Central message can be deduced but is not explicitly stated in the presentation.

	memorable, and strongly supported.)		not memorable.	

Source: Association of American Colleges and Universities

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Scalable and Distributed Computing

Course Code: IT139IU

1. General information

Course name	- (In English): Scalable and Distributed Computing - (In Vietnamese): Tính toán khả năng mở rộng và phân bố
Course designation	Fundamental concepts in distributed computing and discuss system designs enabling distributed applications
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	5,7
Person responsible for the course	Assoc. Prof. Vo Thi Luu Phuong
Language	English
Relation to curriculum	Compulsory (NE, DS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS

<table>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Data Structure and Algorithms</td></tr>
<tr><td>Course objectives</td><td>This course presents the theory, design, implementation, and analysis of distributed systems. Through classroom lectures, labs, projects and exercises, students learn the fundamentals of distributed systems, system models, remote procedure call, distributed objects, operating system support, security in distributed systems, distributed file systems, concurrency, transaction and synchronization, replication. The course also covers advanced topics related to cloud and distributed data processing technologies: data partitioning, storage schemes, stream processing, and parallel algorithms. Course introduces some modern Internet and cloud computing services running on multiple geographically distributed data centers: Google, Yahoo, Facebook, iTunes, Amazon, eBay, Bing, etc.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Understand the concept and design of distributed systems
CLO 2. Apply distributed data processing models and technologies
CLO 3. Communicate to the team to design the data pipeline that can be integrated with distributed system,
CLO 4. Design and implement components of a scalable and distributed system (millions of users and petabytes of data)
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO 1, CLO 2, CLO 3, CLO 4</td></tr>
<tr><td>Skill</td><td>CLO 2, CLO 4</td></tr>
<tr><td>Attitude</td><td>CLO 3</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)</td></tr>
</table>

	Topic	**Weight**	**Level**
	Introduction to Distributed Systems, System Models	1	I, T
	Remote Procedure Call, Distributed Objects	1	I, T
	Operating System Support, Distributed File Systems	1	I, T
	Transaction and Synchronization	1	T, U
	Concurrency Control	1	T, U
	Security	1	T, U
	Fault and Failure	1	T, U
	Introduction to MapReduce	1	T, U
	Scalable K-means algorithms	1	T, U
	Graph and Random-walk algorithms	1	T, U
	Web services, XML, JSON, Node.js	1	T, U
	Peer-to-Peer	1	I, T
	Selected seminar 1: Introduce some distributed pipeline in Industry.	1	I
	Selected seminar 2: Introduce some scalable and distributed products used in Industry.	1	I
Examination forms	Multiple-choice questions, 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. G. Coulouris, J. Dollimore, T. Kindberg, G. Blair, Distributed Systems: Concepts and Design 5th, 2011 2. T. White, Hadoop: The Definitive Guide 4th, 2015 3. A.S. Tanenbaum, M.V. Steen, Distributed Systems: Principles and Paradigms 2nd, 2007		

2. Learning Outcomes Matrix

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	x				
3	x	x				x
4		x				x

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Distributed Systems, System Models	1		Lecture, Discussion	[1,2,3] Chapter 1
2	Remote Procedure Call, Distributed Objects	1	Exercises	Lecture, In-class exercises	[1,3] Chapter 2
3	Operating System Support, Distributed File Systems	1	Exercises	Lecture, In-class exercises	[1,3] Chapter 3
4	Transaction and Synchronization	1,2	Labs	Lecture, In-class exercises	[1,3] Chapter 3,4
5	Concurrency Control	1,2	Labs	Lecture, In-class exercises	[1,3] Chapter 5,6
6	**Midterm**				
7	Security	2,3	Exercises	Lecture, In-class exercises	[1,3] Chapter 6,7
8	Fault and Failure	2,3	Labs	Lecture, In-class exercises	[2] Chapter 5
9	Introduction to MapReduce	2,3	Exercises	Lecture, In-class exercises	[2] Chapter 6,7

10	Scalable K-means algorithms	2,3	Labs	Lecture, In-class exercises	Outside resources
11	Graph and Random-walk algorithms	2,3	Exercises	Lecture, In-class exercises	Outside resources
12	Web services, XML, JSON, Node.js	3,4	Labs	Lecture, In-class exercises	[1,3] Chapter 9,10,11
13	Peer-to-Peer	3,4	Labs	Lecture, In-class exercises	[1,3] Chapter 12
14	Selected seminar 1: Introduce some distributed pipeline in Industry.	4		Discussion	Outside resources
15	Selected seminar 2: Introduce some scalable and distributed products used in Industry.	4		Discussion	Outside resources
16	Revision			Review-test	
17	**Final exam**				

4. Assessment plan

Assessment Type	**CLO 1**	**CLO 2**	**CLO 3**
Labs (20%)		50%	50%
Midterm examination (30%)	50%	50%	
Final examination (40%)	20%	50%	30%
Exercises/ Quiz (10%)	50%	50%	

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

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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.↩

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	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

			taken as 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	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.

	presentation cohesive.			
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,	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from

	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.	authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Data mining

Course Code: IT160IU

1. General information

Course name	- (In English): Data mining - (In Vietnamese): Khai thác dữ liệu
Course designation	This subject introduces the students to the principles and algorithms of data mining, and the requirements of a data mining process.
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	6,8
Person responsible for the course	Nguyen Thi Thanh Sang, Dr.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, laboratory.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1)

	6.18 ECTS
Number of periods	Theory: 45 Practice: 30
Required and recommended prerequisites for joining the course	Object-Oriented Programming
Course objectives	Students will study data mining concepts and algorithms to solve problems of knowledge discovery. They will be equipped with skills of using recent data mining software for solving practical problems and gain experience of doing independent study and research.
Course learning outcomes	

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO 1. Understand basic contents of data warehousing and data mining. CLO 2. Explain modern algorithms in the area of data mining and knowledge discovery.
Skill	CLO 3. Apply data mining techniques to some case studies using existing datasets.
Attitude	CLO 4. Work in a team to build a data mining process.

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	1	I
Know your data	1	T, U
Data preprocessing	1	T, U
Data mining knowledge representation	1	T, U
Evaluating what's been learned	1	T
Data mining algorithms: Classification	2	T, U

	Mining Frequent Patterns, Association and Correlations: Basic Concept and Methods	2	T
	Data mining algorithms: Clustering	2	T
	Classification: Advanced Methods	1	T, I
	Semantic data mining	1	I
Examination forms	Multiple-choice questions, 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] Jiawei Han, Micheline Kamber, *Data Mining: Concepts and Techniques*, 3rd Edition, 2011. [2] Ian H.Witten, Eibe Frank, Mark A. Hall, and Christopher J. Pal, *Data Mining: Practical Machine Learning Tools and Techniques*, Fourth Edition, Morgan Kaufmann, 2016. [3] A. Lawrynowicz, *Semantic Data Mining: An Ontology-based Approach (Studies on the Semantic Web)*, IOS Press (April 15, 2017), ISBN-10 1614997454.		

2. Learning Outcomes Matrix

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
4					x	

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction	1		Lecture, Discussion	[1, 2]. Chapter 1
2	Know your data	1	Quiz.s2	Lecture,	[1]. Chapter 2

				In-class quiz	
3	Data preprocessing	1,4		Lecture, Discussion	[1]. Chapter 3
4	Data mining knowledge representation	1	Quiz.s4	Lecture, In-class quiz	[2]. Chapter 3; Reading [1]. Chapter 4 – Data Warehousing
5	Evaluating what's been learned	1	Quiz.s5	Lecture, In-class quiz	[2]. Chapter 5
6-7	Data mining algorithms: Classification	2,3	Quiz.s6-7	Lecture, In-class quiz	[1]. Chapter 8; [2]. Chapter 4.3
8	Data mining to code	3		Lecture, Discussion	
9	**Midterm**				
10-11	Mining Frequent Patterns, Association and Correlations: Basic Concept and Methods	2,3,4	Quiz.s10-11	Lecture, In-class quiz	[1]. Chapter 6; [2]. Chapter 4.5
12-13	Data mining algorithms: Clustering	2,3,4	Quiz.s12-13	Lecture, In-class quiz	[1]. Chapter 10; [2]. Chapter 4.8
14	Classification: Advanced Methods	2	Quiz.s14	Lecture, In-class quiz	[1]. Chapter 9
15	Semantic data mining	2		Lecture, Discussion	[3]
16	Revision			Review-test	
17	**Final exam**				

1. Laboratory

Week	**Lab**
5	Introduction to Weka
6	Evaluation

7	Simple classifiers
8	Programming - Pre-processing data
9	More classifiers
10	Putting it all together
11	Programming - Clustering
12	Programming - Sequential pattern discovery

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Labs (10%)			100%	
Programming (20%)			70%	30%
Midterm examination (30%)	50%	50%		
Final examination (40%)		40%	60%	

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/hy	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others'	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is

pothesis)	issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	points of view are acknowledged within position (perspective, thesis/ hypothesis).		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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Deep Learning

Course Code: IT157IU

1. General information

Course name	- (In English): Deep Learning - (In Vietnamese): Học sâu
Course designation	This course helps students understand the capabilities, challenges, and consequences of deep learning and prepare students to participate in the development of leading-edge AI technology
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	7
Person responsible for the course	Dr. Mai Hoang Bao An
Language	English
Relation to curriculum	Elective (CS, DS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours

<table>
<tr><td>Credit points</td><td>4 credits (Theory: 3 + Practice: 1)
6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Data Structure and Algorithms</td></tr>
<tr><td>Course objectives</td><td>This course helps students understand the capabilities, challenges, and consequences of deep learning and prepare students to participate in the development of leading-edge AI technology. In this course, students will build and train neural network architectures such as Convolutional Neural Networks, Recurrent Neural Networks, Transformers, and learn how to make them better with strategies such as Dropout, BatchNorm, and more. Get ready to master theoretical concepts and their industry applications using Python and PyTorch and tackle real-world cases.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Understand fundamental concepts of Deep Learning. Get familiar with some popular algorithms used in deep learning models. Understand and be able to use of popular libraries such as NumPy, PyTorch.
CLO 2. Neural Networks for regression and classification. The concept of Multilayer Perceptrons. The essential networks: Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN).
CLO 3. Build, train, and deploy different types of Deep Architectures from traditional to modern Architectures.
CLO 4. Understand and be able to apply deep learning techniques to real-world scenarios: Computer Vision, Natural Language Processing.

<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO 1, CLO 2, CLO 3, CLO 4</td></tr>
<tr><td>Skill</td><td>CLO 3, CLO 4</td></tr>
<tr><td>Attitude</td><td>CLO 3, CLO 4</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**	**Level**
Introduction to Deep Learning Some demos on the applications of Deep Learning	1	I, U
Linear Classifiers, Optimization and Gradient Descent Backpropagation Algorithm Introduction to PyTorch library	1	I, T
Linear Neural Networks for Regression Linear Neural Networks for Classification	1	T, U
Multilayer Perceptrons	1	T, U
Advances in PyTorch library	1	T, U
Convolutional Neural Networks (CNN)	1	T, U
Recurrent Neural Networks (RNN)	1	T, U
Modern CNN: - Networks Using Blocks (VGG) - Multi-Branch Networks (GoogLeNet) - Residual Neural Network (Resnet) - MobileNet	2	T, U
Modern RNN: - Gated Recurrent Units (GRU) - Long Short-Term Memory (LSTM) - Bidirectional RNN - Encoder-Decoder Architecture	2	T, U
Optimization Algorithms used in Deep Learning	1	I, T

		Generative Adversarial Network (GAN) & Deep Convolution GAN	1	T, U	
		Deep Learning in Computer Vision	1	T, U	
		Deep Learning in Natural Language Processing	1	T, U	
Examination forms	Short-answer questions, Long-answer questions, programming 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] Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, The MIT Press 2021, ISBN: 978-0262035613. [2] Aston Zhang, Zachary C. Lipton, Mu Li, and Alexander J. Smola., Dive Into Deep Learning.				

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

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

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Deep Learning Some demos on the applications of Deep Learning	1		Lecture, Discussion	[1, 2] Chapter 1

2	Linear Classifiers, Optimization and Gradient Descent Backpropagation Algorithm Introduction to PyTorch library	1	Exercises	Lecture, In-class exercises	[1, 2] Chapter 2
3	Linear Neural Networks for Regression Linear Neural Networks for Classification	1, 2	Exercises	Lecture, In-class exercises	[2] Chapter 3, 4
4	Multilayer Perceptrons	2	Exercises	Lecture, In-class exercises	[2] Chapter 5
5	Advances in PyTorch library	1, 2	Exercises	Lecture, In-class exercises	[2] Chapter 6
6	Convolutional Neural Networks (CNN)	2	Exercises	Lecture, In-class exercises	[2] Chapter 7
7	Recurrent Neural Networks (RNN)	2	Quiz	Lecture, In-class quiz	[2] Chapter 9
8-9	Modern CNN: - Networks Using Blocks (VGG) - Multi-Branch Networks (GoogLeNet) - Residual Neural Network (Resnet) - MobileNet	2, 3	Exercises	Lecture, In-class exercises	[2] Chapter 8
10	**Midterm**				
11-12	Modern RNN: - Gated Recurrent Units (GRU) - Long Short-Term Memory (LSTM)	2, 3	Exercises	Lecture, In-class exercises	[2] Chapter 10

	- Bidirectional RNN - Encoder-Decoder Architecture				
13	Optimization Algorithms used in Deep Learning	1, 4	Seminar	Lecture, Discussion	[2] Chapter 12
14	Generative Adversarial Network (GAN) & Deep Convolution GAN	3, 4	Seminar	Lecture, Discussion	[2] Chapter 18
15	Deep Learning in Computer Vision	4	Seminar	Lecture, Student presentaion	[2] Chapter 14
16	Deep Learning in Natural Language Processing	4	Seminar	Lecture, Student presentaion	[2] Chapter 15
17	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Quiz (5%)	10%		20%	20%
Labs (10%)	30%	30%		
Midterm examination (30%)	50%	40%		
Projects/Presentations/ Report (15%)	10%		30%	30%
Final examination (40%)		30%	50%	50%

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	Identifies own and others' assumptions and several relevant contexts when	Questions some assumptions. Identifies several relevant contexts when	Shows an emerging awareness of present assumptions

	and carefully evaluates the relevance of contexts when presenting a position.	presenting a position.	presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	(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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications)	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications)

	discussed in priority order.	are identified clearly.	and implications) are identified clearly.	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	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 presentation is	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.

	appropriate to audience.	appropriate to audience.	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	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	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	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

	establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Machine Learning Platforms

Course Code: IT172IU

1. General information

Course name	- (In English): Machine Learning Platforms - (In Vietnamese): Nền tảng máy học
Course designation	This course intends to give student an overview on machine learning; fundamental knowledge & popular machine learning algorithms; and its application.
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	6, 8
Person responsible for the course	Mai Hoang Bao An, PhD.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.

<table>
<tr><td>Workload (incl. contact hours, self-study hours)</td><td>(Estimated) Total workload: 182.5 hours
Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours
Private study including examination preparation, specified in hours: 120 hours</td></tr>
<tr><td>Credit points</td><td>4 credits (Theory: 3 + Practice: 1)
6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Artificial Intelligence</td></tr>
<tr><td>Course objectives</td><td>The goal of this course is to equip students with the understanding, knowledge, and some sorts of practical skills to develop many Machine Learning models with the goal to focus on application. In this course, we emphasize on a class of popular Machine Learning methods in Classification, Regression, Clustering, and Time Series Analysis. Also, we attempt to introduce a list of potential tools that can help students play around with different Advanced Machine Learning techniques. So that, the general goal of this course is to provide students the Machine Learning techniques broadly, not deeply, and the contents are most likely application-based approach.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. gain understanding of machine learning in general and its applications.
CLO 2. can practice with some popular machine learning algorithms at a basic level.
CLO 3. can understand and reproduce different machine learning use cases based on popular platforms.
CLO 4. learn how to select and use machine learning algorithms with a bunch of application.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO 1, CLO 2, CLO 3, CLO 4</td></tr>
<tr><td>Skill</td><td>CLO 3, CLO 4</td></tr>
<tr><td>Attitude</td><td>CLO 3, CLO 4</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>Why is Machine Learning important?
History of Machine Learning</td><td>1</td><td>I</td></tr>
<tr><td>Introduction to Google Cloud and the use of Colab.</td><td>1</td><td>I, U</td></tr>
<tr><td>Fundamentals of Machine Learning and data pipeline</td><td>1</td><td>T, U</td></tr>
<tr><td>Linear and Logistic Regression/Classification</td><td>1</td><td>T, U</td></tr>
<tr><td>Gradient descent methods.</td><td>1</td><td>T, U</td></tr>
<tr><td>MLP for Classification and Regression,
Regression with Regularization</td><td>1</td><td>T, U</td></tr>
<tr><td>Support Vector Machine and Kernel Methods.</td><td>1</td><td>T, U</td></tr>
<tr><td>Multi-class Classification,
Probabilistic Classifiers</td><td>1</td><td>T, U</td></tr>
<tr><td>Neural Networks</td><td>1</td><td>T, U</td></tr>
<tr><td>Introduction to ensemble learning and popular algorithms</td><td>2</td><td>T, U</td></tr>
<tr><td>Time Series Analytics based on Machine Learning</td><td>1</td><td>I, T</td></tr>
<tr><td>Clusstering, Mixture of Gaussians</td><td>1</td><td>T, U</td></tr>
<tr><td>PCA and Introduction to feature engineering.</td><td>1</td><td>T, U</td></tr>
<tr><td>Practical session: Focused discussion on a bunch of problems.</td><td>1</td><td>I, U</td></tr>
</table>

</td></tr>
<tr><td>Examination forms</td><td>short-answer questions, long-answer questions, projects.</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] Jerome H. Friedman, Robert Tibshirani, and Trevor Hastie., The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Second Edition (Springer Series in Statistics). [2] Christopher M. Bishop., Pattern Recognition and Machine Learning (Information Science and Statistics). [3] Kevin P. Murphy., Machine Learning: A Probabilistic Perspective (Adaptive Computation and Machine Learning series). [4] Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.

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				X	
3			X	X		X
4		X				

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Why is Machine Learning important? History of Machine Learning	1		Lecture, Discussion	[2,4] Chapter 1
2	Introduction to Google Cloud and the use of Colab.	1, 2	Exercises	Lecture, In-class exercises	[3] Chapter 1
3	Fundamentals of Machine Learning and data pipeline	1, 2	Exercises, lab	Lecture, In-class exercises	[4] Chapter 2, 3

Week	Topic	CLO	Assessments	Learning activities	Resources
4	Linear and Logistic Regression/Classification	2, 3	Exercises, lab	Lecture, In-class exercises	[4] Chapter 4, 5
5	Gradient descent methods.	2, 3	Exercises, lab	Lecture, In-class exercises	[2,3] Chapter 5,6
6	MLP for Classification and Regression, Regression with Regularization	2, 3	Exercises, lab	Lecture, In-class exercises	[2] Chapter 7, 8
7	Support Vector Machine and Kernel Methods.	2, 3	Exercises, lab	Lecture, In-class exercises	[1] Chapter 5, 6
8	Multi-class Classification, Probabilistic Classifiers	2, 3	Exercises, lab	Lecture, In-class exercises	[1] Chapter 2, 3, 4
9	Neural Networks	2, 3			
10	**Midterm**				
11-12	Introduction to ensemble learning and popular algorithms	2, 3	Exercises, lab	Lecture, In-class exercises	[3] Chapter 1, 2, 3
13	Time Series Analytics based on Machine Learning	2, 3	Exercises, lab	Lecture, In-class exercises	[1,2,3] Chapter 4, 5, 6
14	Clusstering, Mixture of Gaussians	3, 4	Exercises, lab	Lecture, In-class exercises	[1,3] Chapter 6, 7, 8
15	PCA and Introduction to feature engineering.	3, 4	Lab	Lecture, In-class exercises	[1,2,3] Chapter 4, 5, 6
16	Practical session: Focused discussion on a bunch of problems.	4	Seminar	Lecture, In-class exercises	[3] Chapter 6, 7, 8
17	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quiz (5%)	10%		20%	20%
Labs (10%)	30%	30%		
Midterm examination (30%)	50%	40%		
Projects/Presentations/ Report (15%)	10%		30%	30%
Final examination (40%)		30%	50%	50%

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

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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.↩

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	Issue/ problem to be considered critically is stated without clarification or description.

			backgrounds unknown.	
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)	Delivery techniques (posture, gesture, eye contact, and vocal	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness)	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness)

	make the presentation compelling, and speaker appears polished and confident.	expressiveness) make the presentation interesting, and speaker appears comfortable.	make the presentation understandable, and speaker appears tentative.	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	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.

	strongly supported.)			

Source: Association of American Colleges and Universities

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Big Data Analytics

Course Code: IT173IU

1. General information

Course name	- (In English): Big Data Analytics - (In Vietnamese): Phân tích dữ liệu lớn
Course designation	The aim of this course is first to provide the students revision on the critical concepts and knowledges of big data, the goals of big data. Secondly, it gives the students the overview on the popular techniques and latest technologies used to deal with big data analytics.
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	7
Person responsible for the course	Mai Hoang Bao An, PhD.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.

<table>
<tr><td>Workload (incl. contact hours, self-study hours)</td><td>(Estimated) Total workload: 182.5 hours
Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours
Private study including examination preparation, specified in hours: 120 hours</td></tr>
<tr><td>Credit points</td><td>4 credits (Theory: 3 + Practice: 1)
6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Data Analysis</td></tr>
<tr><td>Course objectives</td><td>Big Data Analytics provides baseline general knowledge of the techniques and technologies used in Data era of both small-to-medium tabular data to Big Data solutions. It covers the development of solutions using the Hadoop ecosystem, including MapReduce, HDFS, Apache Spark programming frameworks. This course helps students build a foundation for working with Apache Big Data solutions.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Revise the knowledge of data pipeline, small-to-medium data, types of data and related use cases. Revision on the programming used to handle with data pipeline.
CLO 2. Get knowledge of selecting data solutions. Identify common tools and technologies that can be used to create Big Data solutions.
CLO 3. Get knowledges on popular models of Big Data Analytics with Spark. Design the MapReduce programming framework, including the map, shuffle and sort, and reduce components.
CLO 4. Get to know how to do the learning pipelines with Big Data. Implement Big Data solutions using different big data programming frameworks.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO 1, CLO 2, CLO 3, CLO 4</td></tr>
<tr><td>Skill</td><td>CLO 2, CLO 3, CLO 4</td></tr>
<tr><td>Attitude</td><td>CLO 3, CLO 4</td></tr>
</table></td></tr>
</table>

Content

The description 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**
Revision on data pipeline concepts Introduction to some successful data solutions.	1	I
Introduction to Big Data Introduction to necessary tools	1	I, U
Remind on EDA Remind on Python and some related libraries used to analyze data.	1	T, U
Advanced on programming used to deal with data pipeline, Big Data. Applications in Text Analytics Support Visual Analytics in data pipeline	1	T, U
Summary on data preparation Databases for common data and related contents	1	T, U
Introduction to Dask for handling with Big data.	1	T, U
Practice with Dask	2	
Remind to Hadoop/MapReduce Some examples with the concepts of MapReduce in python.	1	T, U
Data preparation with pySpark - Data manipulation - Data preparation - Miscellaneous	2	I, T
Machine Learning with Spark - Regression - Classification	3	T, U
Basic Text Mining with Spark	1	T, U

			A case study Some advanced topics: Apache Kafka				
Examination forms	Short-answer questions, Long-answer questions, projects						
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] Viktor Mayer-Schönberger, Kenneth Cukier., Big Data: A Revolution That Will Transform How We Live, Work, and Think., Harper Business; Reprint edition. [2] Sumit Pal., SQL on Big Data: Technology, Architecture, and Innovation., Apress; 1st edition. [3] Nandhini Abirami R, Seifedine Kadry, Amir H. Gandomi, Balamurugan Balusamy., Big Data: Concepts, Technology, and Architecture., Wiley; 1st edition. [4] Bill Chambers, Matei Zaharia., Spark: The Definitive Guide: Big Data Processing Made Simple., O'Reilly Media; 1st edition.						

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	X	X			
3		X		X	X	X
4					X	X

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Revision on data pipeline concepts	1		Lecture, Discussion	[1] Chapter 1, 2

Week	Topic	CLO	Assessments	Learning activities	Resources
	Introduction to some successful data solutions.				
2	Introduction to Big Data Introduction to necessary tools	1, 2	Exercises	Lecture, In-class exercises	[1,2] Chapter 2, 3
3	Remind on EDA Remind on Python and some related libraries.	1, 2	Exercises	Lecture, In-class exercises	[1,2,3] Chapter 4, 5
4	Advanced on programming used to deal with data pipeline, Big Data. Applications in Text Analytics Support Visual Analytics in data pipeline	1, 2	Exercises, labs	Lecture, In-class exercises	[2,3] Chapter 5, 6
5	Summary on data preparation Databases for common data and related contents	2, 3	Exercises, labs	Lecture, In-class exercises	[2,3] Chapter 7
6	Introduction to Dask for handling with Big data.	2, 3	Exercises, labs	Lecture, In-class exercises	[2,3] Chapter 8, 9
7-8	Practice with Dask	2, 3, 4	Exercises, labs	Lecture, In-class exercises	[2,3] Chapter 10, 11
9	**Midterm**				
10	Remind to Hadoop/MapReduce Some examples with the concepts of MapReduce in python.	2, 3, 4	Exercises, labs	Lecture, In-class exercises	[4] Chapter 3, 4, 5
11-12	Data preparation with pySpark - Data manipulation - Data preparation - Miscellaneous	2, 3, 4	Exercises, labs	Lecture, In-class exercises	[4] Chapter 6, 7, 8

Week	Topic	CLO	Assessments	Learning activities	Resources
13-15	Machine Learning with Spark - Regression - Classification	2, 3, 4	Projects, labs	Lecture, In-class exercises	[4] Chapter 8, 9, 10, 11
16	Basic Text Mining with Spark A case study Some advanced topics: Apache Kafka	3, 4	Seminar	Lecture, Discussion	[4] Chapter 12
17	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quiz (15%)	20%		20%	20%
Midterm examination (30%)	50%	50%		
Projects/Presentations/ Report (15%)	30%		30%	30%
Final examination (40%)		50%	50%	50%

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

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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.↩

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	Identifies own and others' assumptions and several relevant contexts when	Questions some assumptions. Identifies several relevant contexts when	Shows an emerging awareness of present assumptions

	and carefully evaluates the relevance of contexts when presenting a position.	presenting a position.	presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	(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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications)	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications)

	discussed in priority order.	are identified clearly.	and implications) are identified clearly.	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	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 presentation is	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.

	appropriate to audience.	appropriate to audience.	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	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	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	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

	establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Time Series Analysis

Course Code: IT169IU

1. General information

Course name	- (in English): Time Series Analysis - (in Vietnamese): Phân tích chuỗi thời gian
Course designation	The course will provide a basic introduction to modern time series analysis. We will cover time series regression and exploratory data analysis, ARMA/ARIMA models, model estimation, Fourier analysis, spectral estimation, and state space models
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	6,8
Person responsible for the course	Kieu Vu Thanh Tung, Dr.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, laboratory.
Workload (incl. contact hours, self-study hours)	Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 37.5 (lecture) + 25 (laboratory) Private study including examination preparation, specified in hours: 120 hours

Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS
Number of periods	Theory: 45 Practice: 30
Required and recommended prerequisites for joining the course	Data mining, Data structure and algorithms.
Course objectives	This course introduces the basic time series analysis and forecasting methods. Topics include stationary processes, ARMA models, spectral analysis, model and forecasting using ARMA models, nonstationary and seasonal time series models, multivariate time series, state-space models, and forecasting techniques.
Course learning outcomes	

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO 1. Understand basic contents of time series analysis. CLO 2. Explain modern algorithms in the area of time series analysis.
Skill	CLO 3. Apply time series analysis techniques to some case studies using existing datasets.
Attitude	CLO 4. Work in a team to build a time series analysis process.

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	1	I
Overview of forecasting	1	T, U
Stationary Process and ARMA Models	2	T, U
Spectral Analysis	1	T, U

		Modeling and Forecasting with ARMA Processes	2	T, U	
		Nonstationary and Seasonal Time Series Models	2	T, U	
		Multivariate Time Series	1	T, U	
		State-Space Model	1	T, U	
		Forecasting Techniques	1	T, I	
		Estimation of time series models	1	T, I	
Examination forms	Multiple-choice questions, 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. Box, G.E.P., Jenkins, G.M. and Reinsel, G.C. (1994). Time Series Analysis: Forecasting and Control, 3rd Edition, Prentice Hall, New Jersey. 2. Chatfield, C. (1996). The Analysis of Time Series, 5th edition, Chapman and Hall, New York. 3. Shumway, R.H., Stoffer, D.S. (2006). Time Series Analysis and Its Applications (with R examples). Springer-Verlag, New York. 4. James D. Hamilton (1994). Time Series Analysis, 1st Edition, Princeton University Press, 5. Galit Shmueli and Kenneth C. Lichtendahl Jr (2016). Practical Time Series Forecasting with R: A Hands-On Guide, 2nd Edition, Axelrod Schnall Publishers.				

2. Learning Outcomes Matrix

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	xx					
2	xx					
3						xx
4					xx	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction	1		Lecture, Discussion	[1, 2]. Chapter 1
2	Overview of forecasting	1	Quiz.s2	Lecture, In-class quiz	[3]. Chapter 2
3-4	Stationary Process and ARMA Models	1, 3	Quiz.s3-4	Lecture, Discussion	[1]. Chapter 3
5	Spectral Analysis	1, 3	Quiz.s5	Lecture, In-class quiz	[3]. Chapter 4
6-7	Modeling and Forecasting with ARMA Processes	1, 3	Quiz.s6-7	Lecture, In-class quiz	[1]. Chapter 5
8	**Mid-term Exam**				
9-10	Nonstationary and Seasonal Time Series Models	1, 3	Quiz.s9-10	Lecture, In-class quiz	[1]. Chapter 4
11	Multivariate Time Series	1, 3, 4	Quiz.s11	Lecture, In-class quiz	[1]. Chapter 14 [1]. Chapter 12
12	State-Space Model	1, 2, 4	Quiz.s12	Lecture, In-class quiz	[2]. Chapter 10 [3]. Chapter 6
13	Forecasting Techniques	1, 2, 4	Quiz.s13	Lecture, In-class quiz	[2]. Chapter 5
14	Estimation of time series models	1, 4	Quiz.s14	Lecture, In-class quiz	[2]. Chapter 13

1. Laboratory

Week	Lab
3	Introduction to Python
4	Overview of forecasting
7	Stationary Process and ARMA Models
9	Spectral Analysis
10	Modeling and Forecasting with ARMA Processes
11	Nonstationary and Seasonal Time Series Models
12	Multivariate Time Series
13	State-Space Model

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (10%)			100%	
Programming (20%)			70%	30%
Midterm examination (30%)	50%	50%		
Final examination (40%)		40%	60%	

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	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored,	Issue/ problem to be considered critically is stated without clarification or description.

		impeded by omissions.	boundaries undetermined, and/ or backgrounds unknown.	
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/hy	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue.	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is

pothesis)	issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).		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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

		within the presentation.	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	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from

	to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS
Course Name: Blockchain
Course Code: IT150IU

1. General information

Course name	- (in English): Blockchain - (in Vietnamese): Chuỗi Khối
Course designation	Introduction to Blockchain technology
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	6,7
Person responsible for the course	Tran Thanh Tung, Dr.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1)

<table>
<tr><td></td><td>6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>This subject introduces the students the foundation of blockchain technology and its applications. Students will study blockchain concepts and principles how it works. This course covers relevant topics blockchain space. The course starts with the basics of blockchain, cryptography, fundamental understanding of bitcoins. Then, the applications of blockchain technology is introduced in different areas of finance, healthcare, supply chain, etc. A complete picture of the ecosystem surrounding blockchain technology and development trends are also discussed.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Understand basic contents of blockchain technology.
CLO 2. Explain different types of blockchain development: Ethereum, smart contract security, bitcoin
CLO 3. Apply blockchain techniques to setup the development environment to writing and deploying smart contracts, the workhorse of blockchain applications, integrating cryptocurrency micropayments into web apps
CLO 4. Work in a team to build a blockchain application project.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1, CLO1</td></tr>
<tr><td>Skill</td><td>CLO3, CLO4</td></tr>
<tr><td>Attitude</td><td>CLO2</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</td><td>3</td><td>I</td></tr>
<tr><td>Cryptography & cryptocurrencies</td><td>3</td><td>T</td></tr>
</table></td></tr>
</table>

		How Bitcoin achieve decentralization	3	I, T	
		Mechanics of Bitcoin	3	T, U	
		How to store and use Bitcoin	3	T, U	
		Bitcoin mining	3	T	
		Bitcoin and Anonymity	3	T	
		Ethereum	3	I, T	
		Solidity	3	T, U	
		Token	3	I, T	
		Oracle	3	I, T	
		Decentralized Applications (Dapps)	3	T, U	
		Design pattern for blockchain applications	3	T	
		Real-world applications	3	I, T	
Examination forms	Multiple-choice questions, 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] Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction. Princeton, 2016 [2] Andreas M. Antonopoulos, and Gavin Wood Ph. D. Mastering Ethereum: Building Smart Contracts and DApps. O'Reilly Media, 2018 [3] Xiwei Xu, Ingo Weber, and Mark Staples. Architecture for Blockchain Applications. Springer, 2019.				

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	X				
3		X				X
4						X

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction	1	Quiz	Teaching, Presentation	
2	Cryptography & cryptocurrencies	1	Quiz, In-class exercises	Teaching, Presentation	
3	How Bitcoin achieve decentralization	1, 2	Quiz, In-class exercises	Teaching, Presentation	
4	Mechanics of Bitcoin	1, 2	Quiz, In-class exercises	Teaching, Presentation	
5	How to store and use Bitcoin	1, 2	Quiz, In-class exercises	Teaching, Presentation	
6	Bitcoin mining	1, 2	Quiz, In-class exercises	Teaching, Presentation	
7	Bitcoin and Anonymity	2	Quiz, In-class exercises	Teaching, Presentation	
8	**Midterm**				
9	Ethereum	2,3	Project	Teaching, Presentation	
10	Solidity	2,3	Project	Teaching, Presentation	
11	Token	3,4	Quiz, In-class exercises	Teaching, Presentation	
12	Oracle	2,3	Quiz, In-class exercises	Teaching, Presentation Group discussion	
13	Decentralized Applications (Dapps)	3,4	Quiz, In-class exercises	Teaching, Presentation	
14	Design pattern for blockchain applications	3,4	Quiz, In-class exercises	Teaching, Presentation, In-class reading	
15	Real-world applications	3,4	Presentation	Teaching, Presentation	

Week	Topic	CLO	Assessments	Learning activities	Resources
				Group discussion	
16	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (20%)			x	x
Midterm examination (30%)	x	x		
Final examination (40%)		x	x	
Exercises/ Quiz (10%)	x			

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

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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.↩

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,	Issue/ problem to be considered critically is stated without clarification or description.

			boundaries undetermined, and/ or backgrounds unknown.	
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)	Delivery techniques (posture, gesture, eye contact, and vocal	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness)	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness)

	make the presentation compelling, and speaker appears polished and confident.	expressiveness) make the presentation interesting, and speaker appears comfortable.	make the presentation understandable, and speaker appears tentative.	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	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.

	strongly supported.)			

Source: Association of American Colleges and Universities

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Software Engineering

Course Code: IT076IU

1. General information

Course name	- (in English): Software Engineering - (in Vietnamese): Công Nghệ Phần Mềm
Course designation	This course focuses on the design of software by implementing significant projects in teams
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	5, 7
Person responsible for the course	Assoc. Prof. Dr. Nguyen Thi Thuy Loan
Language	English
Relation to curriculum	Compulsory (CS, CE) Elective (NE)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 37.5 (lecture) + 25 (laboratory) Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1)

	6.18 ECTS
Number of periods	Theory: 45 Practice: 30
Required and recommended prerequisites for joining the course	Object-Oriented Programming Principles of Database Management
Course objectives	This course provides students the fundamentals of software engineering concepts, methodologies, and processes. It covers the subjects on software process models, agile development methodologies, requirements engineering and analysis models, software design and implementation methods, test strategies, and software evolution. Students apply contemporary agile requirements analysis, planning, architecture, design, implementation and testing practices to software engineering project work in small teams.
Course learning outcomes	CLO 1. Describe the implement of software development process. CLO 2. Apply the principles and methods of software engineering in practice. CLO3. Practice teamwork skills in a software engineering project.

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1
Skill	CLO2, CLO3
Attitude	CLO3

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**
Software development in practice	3	I
Beginning a project	3	T, U
Requirements	7.5	T, U
The user experience	4.5	T, U
System design	6	T, U
Program development	7.5	T, U
Reliability and testing	6	T, U
The business of software development	4.5	T, U

		Review	3	I, U	
Examination forms	Multiple-choice questions, 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. Ian Sommerville, Software Engineering 10th, 2019. 2. Hyrum Wright, Titus Winters, and Tom Manshreck. Software Engineering at Google, 2020 3. Hans van Vliet, Software Engineering: Principles and Practice 3rd, 2008				

2. Learning Outcomes Matrix

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						xxx
2			xx			xxx
3			xx		xxx	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Software development in practice	1	Quiz	Lecture	[1]
2	Beginning a project	1,3	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,3]
3	Requirements	2,3	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,2]
4	The user experience	2,3	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,2]
5	System design	2,3	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,2,3]
6	**Midterm**				
7	Program development	2,3	Quiz, Final, Project	Lecture, Discussion, In-class, exercise	[1,2,3]

8	Reliability and testing	2,3	Quiz, Final, Project	Lecture, Discussion, In-class, exercise	[1,2,3]
9	The business of software development	2,3	Quiz, Project	Lecture, Discussion, In-class, exercise	[1,2,3]
10	Review	1,3	Quiz	Discussion, In-class, exercise	[1,2]
11	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Midterm examination (25%)	30%	20%	
Projects/Presentations/ Report (25%)	30%	30%	60%
Final examination (40%)	30%	40%	
Exercises/ Quiz (10%)	10%	10%	40%

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

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,	Issue/ problem to be considered critically is stated without clarification or description.

			boundaries undetermined, and/ or backgrounds unknown.	
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	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

			(or vice versa).	
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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications)	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications)

	perspectives discussed in priority order.	are identified clearly.	(consequences and implications) are identified clearly.	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	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 presentation is	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is

	appropriate to audience.	appropriate to audience.	appropriate to audience.	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	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or	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

		establishes the presenter's credibility/ authority on the topic.	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Natural Processing Languages

Course Code: IT170IU

1. General information

Course name	- (in English): Natural Processing Languages - (in Vietnamese): Xử Lý Ngôn Ngữ Tự Nhiên
Course designation	This course provides an introduction to the field of Natural Language Processing (NLP), covering fundamental concepts, techniques, and applications for understanding and processing human language by computers. Students will learn about text preprocessing, language modeling, sentiment analysis, and machine translation. The course includes hands-on programming assignments and projects to reinforce theoretical concepts and practical skills.
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	6,8
Person responsible for the course	Assoc. Prof. Nguyen Thi Thuy Loan, PhD.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, laboratory.
Workload (incl. contact hours, self-study hours)	Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 37.5 (lecture) + 25 (laboratory)

	Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS
Number of periods	Theory: 45 Practice: 30
Required and recommended prerequisites for joining the course	Data structure and algorithms; Principle of Database Management; Data Analysis.
Course objectives	- Understand fundamental concepts and techniques in Natural Language Processing (NLP). - Develop practical skills in implementing NLP algorithms and models. - Apply NLP techniques to analyze and process textual data for various applications. - Gain insight into the ethical considerations and challenges in NLP.
Course learning outcomes	

Competency level	**Course learning outcome (CLO)**
Knowledge	CLO1. Apply core NLP concepts to analyze and preprocess textual data effectively
Skill	CLO2. Implement NLP models and algorithms to solve language-related tasks. CLO3: Evaluate the performance of NLP techniques and models using appropriate metrics
Attitude	CLO 4. Examine ethical considerations and challenges in NLP applications.

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	2	I, T

	Text Preprocessing	2	T, U
	Language Modeling	2	T, U
	Sentiment classification	2	T, U
	Logistic Regression	2	T, U
	Vector Semantics and Embedding	2	T, U
	Neural Networks and Neural Language Models	2	T, U
	Machine Translation (optional)	1	T,U

Examination forms	Multiple-choice questions, 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. Daniel Jurafsky, James H. Martin. (2018). Speech and Language Processing, 2rd Edition. Prentice Hall. 2. Daniel Jurafsky, James H. Martin. (2023 ed. draft). Speech and Language Processing, 3rd Edition. 3. Additional research papers and online resources provided during the course

2. Learning Outcomes Matrix

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		x			
3					x	x
4					x	

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1-2	Introduction	1	Quiz	Lecture, Discussion	[1, 2]. Chapter 1
3-4	Text Preprocessing	1	Quiz/ exercise	Lecture,	[1,2]. Chapter 2; [3]

				In-class quiz	
5-6	Language Modeling	2, 3	Quiz/ exercise	Lecture, Discussion	[1,2]. Chapter 3; [3]
7-8	Sentiment classification	2, 3	Quiz/ exercise	Lecture, In-class quiz	[1,2]. Chapter 4; [3]
	Mid-term Exam				
9-10	Logistic Regression	2, 3	Quiz/ exercise	Lecture, In-class quiz	[1,2]. Chapter 5; [3]
11-12	Vector Semantics and Embedding	1, 3	Quiz/ exercise	Lecture, In-class quiz	[1,2]. Chapter 6; [3]
13-14	Neural Networks and Neural Language Models	1, 3, 4	Quiz/ exercise	Lecture, In-class quiz	[1,2]. Chapter 7; [3]
15	Machine Translation (optional)	1, 3, 4	Discuss	Group	[1,2]. Chapter 13; [3]

1. Laboratory

Week	**Lab**
1-2	Text Preprocessing
3	Language Modeling
4	Sentiment classification
5	Vector Semantics and Embedding
6-7	Neural Networks and Neural Language Models
8	Test Final

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Labs (10%)	30%		70%	
Assignment (20%)		20%	50%	30%
Midterm examination (30%)	50%	50%		
Final examination (40%)		40%	60%	

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	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact,

	experts are questioned thoroughly.	experts are subject to questioning.	synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	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	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or

	information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Human-Computer Interaction

Course Code: IT044IU

1. General information

Course name	- (in English): Human-Computer Interaction - (in Vietnamese): Thiết kế giao diện và trải nghiệm người dùng
Course designation	This course provides students with fundamental interaction principles between human and computers.
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	7,8
Person responsible for the course	Dr. Vi Chi Thanh
Language	English
Relation to curriculum	Elective (CS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS
Number of periods	Theory: 45 Practice: 30

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>This course provides students with fundamental interaction principles between human and computers.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Know how to gather requirements.
CLO 2 Apply human-computer interaction principles in user interface design process
CLO 3 Choose the appropriate interface evaluation method
CLO 4. Understand different design principles for mobile applications, the Web, and emerging technologies.

<table><tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr><tr><td>Knowledge</td><td>2, 3, 4</td></tr><tr><td>Skill</td><td>1</td></tr><tr><td>Attitude</td><td>1</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>Human factors</td><td>1</td><td>I</td></tr><tr><td>Human perception and cognition principles</td><td>2</td><td>T</td></tr><tr><td>User-centered design</td><td>2</td><td>T,U</td></tr><tr><td>Requirements gathering techniques</td><td>1</td><td>T,U</td></tr><tr><td>Interface design process</td><td>2</td><td>T,U</td></tr><tr><td>Prototyping techniques</td><td>2</td><td>T,U</td></tr><tr><td>Interface evaluation methodology</td><td>1</td><td>T,U</td></tr><tr><td>Design for diversity</td><td>1</td><td>T</td></tr></table></td></tr>
</table>

		HCI for mobile applications, the Web, and emerging technologies	2	T,U	
		Data analysis	1	T,U	
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] Sharp, H., Preece, J., Rogers, Y. (2019). Interaction Design: Beyond Human-Computer Interaction. United Kingdom: Wiley. [2] Dix, A. (2003). Human-computer Interaction. Germany: Pearson/Prentice-Hall. [3] Krug, S. (2014). Don't Make Me Think, Revisited: A Common Sense Approach to Web Usability (3rd. ed.). New Riders Publishing, USA. [4] Norman, D. A. (2013). The design of everyday things. MIT Press.				

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

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

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Human factors	1	Midterm exam	In-class activities	
2,3	Human perception and cognition principles	2	Midterm exam	In-class activities	
4,5	User-centered design	2	Midterm exam,	In-class activities	

			Project, Lab quiz		
6	Requirements gathering techniques	1	Midterm exam, Project	In-class activities	
7,8	Interface design process	2	Midterm exam, Project	In-class activities	
Midterm exam					
9,10	Prototyping techniques	2	Project	In-class activities	
11	Interface evaluation methodology	3	Final exam, Project	In-class activities	
12	Design for diversity	3	Final exam	In-class activities	
13,14	HCI for multisensory and emerging technologies	4	Lab quiz	In-class activities	
15	Data analysis	2, 4	Final exam, Project	In-class activities	
Final exam					

4. Assessment plan

Assessment Type	**CLO 1**	**CLO 2**	**CLO 3**	**CLO 4**
Quiz (5%)	10%		20%	20%
Labs (10%)	30%	30%		
Midterm examination (30%)	50%	40%		
Projects/Presentations/ Report (15%)	10%		30%	30%
Final examination (40%)		30%	50%	50%

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	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

			taken as 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	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.

	presentation cohesive.			
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,	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from

	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.	authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Web Application Development

Course Code: IT093IU

1. General information

Course name	- (in English): Web Application Development - (in Vietnamese): Phát triển ứng dụng web
Course designation	This subject introduces to students the development of web application. How to design and program a web-app in practice based on the tools, techniques and web frameworks
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	6
Person responsible for the course	Assoc. Prof. Nguyen Van Sinh
Language	English
Relation to curriculum	Compulsory (NE, CE, CS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory)

<table>
<tr><td></td><td>Private study including examination preparation, specified in hours: 120</td></tr>
<tr><td>Credit points</td><td>4 credits (Theory: 3 + Practice: 1)
6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Object-Oriented Programming
Principles of Database Management</td></tr>
<tr><td>Course objectives</td><td>This course provides students the fundamentals of web design and web programming. It provide the concepts and models of HTML, Java Server Page, Java Bean, MVC model, Java utilities and development environments, extended Java frameworks, several new frameworks with different programming languages. To develop skills in understanding and evaluating web-based systems, as well as to develop skills in designing and developing web-based applications.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Understand web design, web programming concepts and models.
CLO 2. Apply to design and develop static/dynamic web application with HTML, Java Server Pages, Java Bean, extended Java and other frameworks based on the MVC model.
CLO 3. Apply knowledge and ability to manage and use Java, XML utilities and IDE for developing web applications with DBMS.
CLO 4: work in group, communication, interaction and responsible within a team.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1</td></tr>
<tr><td>Skill</td><td>CLO2, CLO3</td></tr>
<tr><td>Attitude</td><td>CLO4</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 teaching hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)</td></tr>
</table>

	Topic	**Weight**	**Level**
	Week 1: Introduction to the course and HTML	3	I,T
	Week 2: Advanced HTML and CSS	3	I,T,U
	Week 3: Introduction to J2EE and new frameworks in web application	3	I,T
	Week 4 : Servlet	3	I,T,U
	Week 5: Java server page and JDBC	3	I,T,U
	Week 6: Java Bean and MVC	3	I,T,U
	Week 7: Web state, session, cookies & midterm review	3	I,T,U
	Week 8: Java Script, APIs and Libraries	3	I,T,U
	Week 9&10: Node JS Framework	3	I,T,U
	Week 11: Graphical models on the webpage, web multimedia and web 360	3	I,T,U
	Week 12&13: XML & XSLT	3	I,T,U
	Week 14: Ajax framework	3	I,T,U
	Week 15: the existing web frameworks & final review	3	I,T,U
Examination forms	Multiple-choice questions, short-answer questions and programming		
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. Dave Wolf and A.J. Henley. "Java EE Web Application Primer Building Bullhorn: A Messaging App with JSP, Servlets, JavaScript, Bootstrap and Oracle", 2017. 2. Prem Kumar Karunakaran. "Java Web Application Development", second edition, 2020. 3. Laura Ubelhor and Christian Hur. "Developing Business Application for the Web With HTML, CSS, JSP, PHP, ASP.NET and JavaScript", 2017. 4. *Refer VN book: N.V.Sinh, N.T.T.Sang, T.M.Hà* "Xây dựng ứng dụng Web cho Thương mại điện tử trên Netbeans", Nhà xuất bản Xây dựng 2017		

2. Learning Outcomes Matrix

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				
3		X				X
4					X	

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to the course and HTML	1	Quiz	Lecture,	[1,2]
2	Advanced HTML and CSS	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3]
3	Introduction to J2EE and new frameworks in web application	1	Quiz, Midterm	Lecture, Discussion	[1,2]
4	Servlet	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
5	Java server page and JDBC	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
6	Java Bean and MVC	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
7	Web state, session, cookies & midterm review	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
8	Java Script, APIs and Libraries & midterm review	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]

9	Node JS Framework	2,3	Quiz, Lab	Lecture, Discussion, In-class exercises	[1,2,3,4]
10	Node JS Framework (continue)	2,3	Quiz, Lab	Lecture, Discussion, In-class exercises	[1,2,3,4]
11	Graphical models on the webpage, web multimedia and web 360	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
12	XML & XSLT	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
13	XML & XSLT (continue)	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
14	Ajax framework	2,3	Quiz, Lab	Lecture, Discussion, In-class exercises	[1,2,3,4]
15	Existing web frameworks & final review	2,3	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
16	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Labs (20%)		30%	40%	30%
Midterm examination (30%)	40$	60%		
Exercises/Quiz (10%)	30%	40%	30%	
Final examination (40%)		50%	50%	

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	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed	Conclusion is logically tied to a range of information, including opposing	Conclusion is logically tied to information (because information is chosen to fit the	Conclusion is inconsistently tied to some of the information discussed;

consequences)	evaluation and ability to place evidence and perspectives discussed in priority order.	viewpoints; related outcomes (consequences and implications) are identified clearly.	desired conclusion); some related outcomes (consequences and implications) are identified clearly.	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	Language choices are thoughtful and generally support the	Language choices are mundane and commonplace and partially	Language choices are unclear and minimally support the effectiveness of

	enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	effectiveness of the presentation. Language in presentation is appropriate to audience.	support the effectiveness of the presentation. Language in presentation is appropriate to audience.	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 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

	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Business Process Analysis

Course Code: IT144IU

1. General information

Course name	- (In English): Business Process Analysis - (In Vietnamese): Phân tích quy trình nghiệp vụ
Course designation	The course aims to provide fundamental knowledge of business process analysis, improvement and evaluation.
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is	7
Person responsible for the course	Assof. Pror.Dr. Vo Thi Luu Phuong
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS

<table>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>Every organization thrives to implement effective business processes to increase employee and customer satisfaction, enhance business performance, reduce costs and boost productivity. All activities including altering critical processes, merging or splitting business units require a consistent framework to manage the changes. The course aims to provide fundamental knowledge of business process analysis, improvement and evaluation. Various approaches, techniques and software tools used to analyze and manage business process improvement are also introduced in the course.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Practice the Framework for Process Improvement
CLO 2. Identify and analyze an organization's business process using different techniques such as ANSI, Swim Lane, Business Process Diagrams, UML, SIPOC, and Value Stream Maps
CLO 3. Evaluate process improvement effectiveness

<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>1, 2, 3</td></tr>
<tr><td>Skill</td><td>1, 3</td></tr>
<tr><td>Attitude</td><td></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)</td></tr>
</table>

	Topic	Weight	Level	
	Data Science in Action	1	I	
	Process Models and Process Discovery	3	T, U	
	Different Types of Process Models	4	T,U	
	Process Discovery Techniques and Conformance Checking	3	T,U	
	Enrichment of Process Models	3	T,U	
	Operational Support and Conclusions	1	I	

Examination forms	Multiple-choice questions, 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	

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				
3		X	X			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Data Science in Action	2	Midterm	In-class activities	

Week	Topic	CLO	Assessments	Learning activities	Resources
2	Process Models and Process Discovery	2, 5	Midterm, Quiz, Project, Lab	In-class activities, quiz	
3	**Midterm**				
4	Different Types of Process Models	2	Final, Project, Lab	In-class activities	
5	Process Discovery Techniques and Conformance Checking	2, 3	Final, Project, Quiz, Lab	In-class activities, Quiz	
6	Enrichment of Process Models	2	Final, Project, Lab	In-class activities	
7	Operational Support and Conclusions	2	Final, Project, Lab	In-class activities	
8	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (20%)	20%	20%	
Midterm examination (30%)	50%	40%	
Final examination (40%)		20%	60%
Exercises/ Quiz/ Project (10%)	30%	20%	40%

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

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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.↩

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	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact,

	experts are questioned thoroughly.	experts are subject to questioning.	synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	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	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.

	presentation cohesive.			
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,	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from

	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.	authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Decision Support Systems

Course Code: IT145IU

1. General information

Course name	- (In English): Decision support systems - (In Vietnamese): Hệ thống hỗ trợ quyết định
Course designation	Introduction to the decision support system (DSS), an interactive computer-based system (or subsystem) intended to help decision makers. DSS simulate cognitive decision-making functions of humans based on AI methods including the area of knowledge: Expert systems, Data mining, Machine learning, Connectionism, Logical reasoning.
Course type	☐ *General knowledge* ☐ *Fundamental* ☑ *Specialized knowledge* ☐ *Internship/Project/Thesis* ☐ *Others:…….*
Semester(s) in which the course is taught	__semester__
Person responsible for the course	Nguyen Van Sinh, Assoc.Prof.
Language	English
Relation to curriculum	Compulsory / elective / specialisation Names of other study programmes with which the module is shared
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours

	Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS
Number of periods	Theory: 45 Practice: 30
Required and recommended prerequisites for joining the course	Object-Oriented Programming
Course objectives	A Decision Support System (DSS) is an interactive computer-based system or subsystem intended to help decision makers use communications technologies, data, documents, knowledge and/or models to identify and solve problems, complete decision process tasks, and make decisions. DSS simulate cognitive decision-making functions of humans based on artificial intelligence methodologies (including expert systems, data mining, machine learning, connectionism, logistical reasoning, etc.) in order to perform decision support functions. DSS is a general term for any computer application that enhances a person or group's ability to make decisions. Also, DSS refers to an academic field of research that involves designing and studying DSS in their context of use.
Course learning outcomes	CLO 1. Understand the goals and different forms of decision support, and gain knowledge of the practical issues of implementation CLO 2. Examine systems based on statistical and logical approaches to decision making that include statistical prediction, rule-based systems, case-based reasoning, neural networks, fuzzy logic, etc. CLO 3. Obtain an overview of the various computerized decision support techniques together with a detailed assessment of successful and unsuccessful applications developed CLO 4. Examine the actual and potential impact of the technology together with the challenges associated with this kind of application

	Competency level	Course learning outcome (CLO)	
	Knowledge		
	Skill		
	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)		
	ic	**Weight**	**Level**
	Introduction to Decision Making and Decision Support	3	I, U
	Models, Cognitive Tools and Decision Making	3	I, T, U
	Decision support systems	3	I, T, U
	Modeling and analysis	3	I, T, U
	Data warehousing, Data Acquisition, Data Mining, Business analysis, and visualization	3	I, T, U
	Decision support system development	3	I, T, U
	Collaborative computing technologies: Group support systems	3	I, T, U
	Review for Midterm Exam	3	U
	Enterprise Information Systems	3	I, T, U
	Knowledge management	3	I, T, U
	Artificial intelligent & Expert systems: Knowledge-Based systems	3	I, T, U
	Knowledge Acquisition, Representation and Reasoning	3	I, T, U
	Advanced Intelligent Systems	3	I, T, U
	Ecommerce applications	3	I, T, U
	Review for final exam	3	U
Examination forms	Multiple-choice questions, 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	

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				
4				x		

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Decision Making and Decision Support	1			
2	Models, Cognitive Tools and Decision Making	2,3			
3	Decision support systems	2,3			

Week	Topic	CLO	Assessments	Learning activities	Resources
4	Modeling and analysis	2,3,4			
5	Data warehousing, Data Acquisition, Data Mining, Business analysis, and visualization	2,3,4			
6	**Midterm**				
7	Decision support system development	2,3,4			
8	Collaborative computing technologies: Group support systems	2,3,4			
9	Enterprise Information Systems	2,3,4			
10	Knowledge	2,3,4			

Week	Topic	CLO	Assessments	Learning activities	Resources
	management				
11	Artificial intelligent & Expert systems: Knowledge-Based systems	2,3,4			
12	Knowledge Acquisition, Representation and Reasoning	2,3,4			
13	Advanced Intelligent Systems	2,3,4			
14	Ecommerce applications	2,3,4			
15	**Final exam**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (25%)	x	x	x	x
Midterm examination (30%)	x	x		

Assessment Type	CLO1	CLO2	CLO3	CLO4
Final examination (40%)		x	x	x
Exercises/ Quiz (10%)	x	x	x	x

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

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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.↩

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	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective,	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

	synthesized within position (perspective, thesis/ hypothesis).	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 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	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 appropriate	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to

	the presentation or establishes the presenter's credibility/ authority on the topic.	reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Theory of Networks

Course Code: IT146IU

1. General information

Course name	- (in English): Theory of Networks - (in Vietnamese): Lý Thuyết Mạng
Course designation	The course introduces the interconnectedness of modern life, answers the fundamental questions about how our social, economic, and technological worlds are connected.
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	6 or 7
Person responsible for the course	Assoc. Pror. Dr. Vo Thi Luu Phuong,
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, laboratory.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours

<table>
<tr><td>Credit points</td><td>4 credits (Theory: 3 + Practice: 1)
6.18 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>The course introduces the interconnectedness of modern life, answers the fundamental questions about how our social, economic, and technological worlds are connected. Students will study the modern network models, such as, game theory, the structure of the Internet, social contagion, the spread of social power and popularity, and information cascades.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Use the tools of graph theory as a basis for studying the Internet social networks, and the process of Web search.
CLO 2. Apply game theory to analyze strategic behavior in a variety of settings including auction design, Web advertising, network routing, and social marketing.
CLO 3. Analyze the processes by which ideas, beliefs, opinions, products, technologies, and social conventions spread through social networks.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1, 2</td></tr>
<tr><td>Skill</td><td>CLO1, 2</td></tr>
<tr><td>Attitude</td><td>CLO3</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 (hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Network graphs;</td><td>9</td><td>T, U</td></tr>
<tr><td>Network games, auctions</td><td>12</td><td>T, U</td></tr>
<tr><td>The Structure of the Web</td><td>6</td><td>T, U</td></tr>
<tr><td>Sponsored Search Markets</td><td>1</td><td>T, U</td></tr>
</table></td></tr>
</table>

		Network Effects	6	T, U	
		Markets and Information	9	T, U	
Examination forms	Multiple-choice questions, 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. David Easley and Jon Kleinberg, Networks, Crowds, and Markets: Reasoning about a Highly Connected World 1st, 2010 2. Thomas W. Miller, Web and Network Data Science: Modeling Techniques in Predictive Analytics 1st, 2014 3. James Kurose and Keith Ross, Computer networking: A top-down approach 7th, 2016				

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	XX					
2	XX					X
3					X	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1-3	Network graphs	1,2	Quiz, Midterm, Homework	Lecture, discussion, in-class exercise, laboratory	[1, 2, 3]
4-7	Network games, auctions	1,2,3	Quiz, Midterm, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]
	Midterm				
9-10	The Structure of the Web	1,2,3	Quiz, Final, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]

11-12	Sponsored Search Markets	2,3	Quiz, Final, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]
13	Network Effects	1,2	Quiz, Final, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]
14-15	Markets and Information	1,2,3	Quiz, Final, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]
	Final exam				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Labs (25%)		33.3%	50%
Midterm examination (30%)	33.3%	33.3%	
Homework (10%)	33.3%		50%
Final examination (35%)	33.3%	33.3%	

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

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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.↩

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,	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is	Issue/ problem to be considered critically is stated but description	Issue/ problem to be considered critically is stated without

	delivering all relevant information necessary for full understanding.	not seriously impeded by omissions.	leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	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	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	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions).

	contexts when presenting a position.		be more aware of others' assumptions than one's own (or vice versa).	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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and

	evidence and perspectives discussed in priority order.	and implications) are identified clearly.	outcomes (consequences and implications) are identified clearly.	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	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

	appropriate to audience.	appropriate to audience.	presentation is appropriate to audience.	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	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

		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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS
Course Name: IT Project Management
Course Code: IT056IU

1. General information

Course name	- (in English): IT Project Management - (in Vietnamese): Quản Lý Dự Án CNTT
Course designation	This subject introduces to students the process of IT project management; the area of knowledge required and techniques appropriate for successful IT project management.
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	7
Person responsible for the course	Assoc. Prof. Nguyen Van Sinh
Language	English
Relation to curriculum	All programs: Elective course
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours

	Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS
Number of periods	Theory: 45 Practice: 30
Required and recommended prerequisites for joining the course	Object-Oriented Programming
Course objectives	This course provides students the fundamental IT project management knowledge, with particular emphasis on software products, project management and contemporary issues in the delivery of software solutions to business. It considers plan-driven and agile methodologies, estimating techniques, change management, risk management, and the role of project management in business. And it identifies the managerial control and reporting aspects necessary from inception to implementation of a software development project.
Course learning outcomes	CLO 1. Explain the IT project management process; CLO 2. Identify the areas of knowledge required for successful IT project management; CLO 3. Apply techniques appropriate for successful software project management; CLO 4. Communicate effectively to the team and stakeholders; construct project related documentation. **Competency level** / **Course learning outcome (CLO)** Knowledge / CLO1 Skill / CLO2, CLO3 Attitude / CLO4
Content	*The description of the contents should clearly indicate the weighting of the content and the level.* Weight: lecture session (3 teaching hours) Teaching levels: I (Introduce); T (Teach); U (Utilize) **Topic** / **Weight** / **Level**

	Week 1: Orientation & Introduction to the course	3	I,T
	Week 2: Introduction to IT project management	3	I,T
	Week 3: Software project planning	3	I,T,U
	Week 4: Estimation (cost, time, scope)	3	I,T,U
	Week 5: Project Schedules	3	I,T,U
	Week 6: Review process	3	I,T,U
	Week 7: Software Requirement	3	I,T,U
	Week 8: Design & Programming	3	I,T,U
	Week 9: Review for midterm examination	3	U
	Week 10: Design and Programming	3	I,T,U
	Week 11: Software Testing	3	I,T,U
	Week 12: Understanding Change	3	I,T,U
	Week 13: Management and Leadership	3	I,T,U
	Week 14: Managing an Outsourced Project	3	I,T,U
	Week 15: Process Improvement.	3	I,T,U
Examination forms	Multiple-choice questions, short-answer questions and essay writing		
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. Kathy Schwalbe, IT Project Management - 9th Edition, 2019 2. Stellman and Greene, *Applied Software Project Management*, O'Reilly Media, 2006. 3. Marchewka, J.T., Information Technology Project Management Providing Measureable Organizational Value 5th, 2016		

2. Learning Outcomes Matrix

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	X			
3		X				X
4			X		X	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Orientation & Introduction to the course	1	Question and answer	Lecture,	[1, 2, 3]
2	Introduction to IT project management	1	Question and answer	Lecture, Discussion, In-class exercises	[1, 2, 3]
3	Software project planning	2,3	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
4	Estimation (cost, time, scope)	2,3	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
5	Project Schedules	2,3	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
6	Review process	2,3	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
7	Software Requirement	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
8	Design & Programming	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
9	Review for midterm examination	1,2,3		Discussion,	

				In-class exercises	
10	Design and Programming	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
11	Software Testing	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
12	Understanding Change	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
13	Management and Leadership	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
14	Managing an Outsourced Project	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
15	Process Improvement.	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
16	**Final examination**	2,3,4			

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Midterm examination (30%)	40%	50%		
Projects/Presentations/ Report (20%)		40%	30%	30%
Final examination (40%)			70%	30%
Exercises/ Quiz (10%)	25%	25%	25%	25%

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*	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	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.

conclusion		subject to questioning.	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 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	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 appropriate	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to

	appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Information System Management

Course Code: IT094IU

1. General information

Course name	- (in English): Information System Management - (in Vietnamese): Quản Lý Hệ Thống Thông Tin
Course designation	This course covers the concepts of information systems and their applications to business processes
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	6
Person responsible for the course	Dr. Tran Thanh Tung
Language	English
Relation to curriculum	Elective course (CS, DS) Specialization (required) (NE)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1)

	6.18 ECTS
Number of periods	Theory: 45 Practice: 30
Required and recommended prerequisites for joining the course	Principles of Database Management
Course objectives	This course will aim to provide students with:The concepts of information systems and their applications to business processes.Use of computer-based information systems in functional areas of business. Understanding of computer and information technology, resources, management and end-user decision making, and system development.
Course learning outcomes	CLO 1. understand basic information system concepts as applied to business operations and management. CLO 2. identify the major components of a computer system, including hardware, software, operating systems and operating environments as they apply to information systems. CLO 3. develop basic MIS applications such as spreadsheet, database, and web development.

Competency level	**Course learning outcome (CLO)**
Knowledge	1, 2
Skill	3
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**
Information Systems in Global Business;	1	I
Global E-Business and Collaboration;	1	I

	Information Systems, Organizations and Strategy	2	T
	Ethical and Social Issues in Information Systems;	1	T
	Telecommunications, the Internet, and Wireless Technology;	1	T
	Foundations of Business Intelligence: Databases and Information Management	1	T,U
	E-Commerce: Digital Markets, Digital Goods;	2	T,U
	Achieving Operational Excellence and Customer Intimacy: Enterprise Applications;	2	T,U
	Building Information Systems;	2	T,U
	Managing Knowledge;	1	T
	Enhancing Decision Making.	1	T
Examination forms	Multiple-choice questions, 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. Kenneth C. Laudon, Jane P. Laudon, Management Information Systems: Managing the Digital Firm 14th, 2016 2. Kenneth C. Laudon and Jane Laudon, Essentials of Management Information Systems 11th, 2015		

2. Learning Outcomes Matrix

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				

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Information Systems in Global Business;	1	Midterm exam	In-class activities	
2	Global E-Business and Collaboration;	1	Midterm exam	In-class activities	
3	Information Systems, Organizations and Strategy	1,2	Midterm exam, Quiz	In-class activities, Lab	
4	Ethical and Social Issues in Information Systems;	1	Midterm exam		
5	Telecommunications, the Internet, and Wireless Technology;	2	Midterm exam	In-class activities, Lab	
6	**Midterm**				
7	Foundations of Business Intelligence: Databases and Information Management	2,3	Final exam	In-class activities, Lab	
8	E-Commerce: Digital Markets, Digital Goods;	1	Final exam	In-class activities, Lab	
9	Achieving Operational Excellence and Customer Intimacy: Enterprise Applications;	1	Final exam	In-class activities, Lab	
10	Building Information Systems;	2,3	Final exam	In-class activities, Lab	
11	Managing Knowledge;	1	Final exam		
12	Enhancing Decision Making.	1	Final exam		
13	**Final exam**				

1.

4. Assessment plan

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

Assessment Type	CLO 1	CLO 2	CLO 3
Midterm examination (30%)	40%	30%	20%
Projects/Presentations/ Report (20%)		40%	60%
Final examination (40%)	30%	20%	20%
Exercises/ Quiz (20%)	30%	10%	

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/	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

	hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	(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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

	the content of the presentation cohesive.	observable within the presentation.	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)	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies,

	make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

	VIETNAM NATIONAL UNIVERSITY HCMC **INTERNATIONAL UNIVERSITY** School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Cloud Computing

Course Code: IT164IU

1. General information

Course name	- (in English): Cloud Computing - (in Vietnamese): Điện Toán Đám Mây
Course designation	The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure.
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	7
Person responsible for the course	Dr. Le Duy Tan
Language	English
Relation to curriculum	Elective (CS, NE, CE)
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours. Private study including examination preparation, specified in hours: 120 hours.
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS

<table>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 30</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Fundamental Concepts of Data Security</td></tr>
<tr><td>Course objectives</td><td>This course concentrates on parallel programming techniques for cloud computing and large-scale distributed systems which form the cloud infrastructure. The topics include overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art solutions for cloud computing developed by Google, Amazon, Microsoft, Yahoo, VMWare, etc. Students will also apply what they learn in one programming assignment and one project executed over Amazon Web Services.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Analyze the trade-offs between deploying applications in the cloud and over the local infrastructure.
CLO 2. Able to deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine.
CLO 3. Solve a real-world problem using cloud computing through group collaboration.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>1</td></tr>
<tr><td>Skill</td><td>2, 3</td></tr>
<tr><td>Attitude</td><td>3</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 Cloud Computing</td><td>1</td><td>I</td></tr>
<tr><td>Cloud Computing Platforms</td><td>3</td><td>T</td></tr>
</table></td></tr>
</table>

	Parallel Programming in the Cloud	3	T, U
	Distributed Storage Systems	3	T, U
	Virtualization	2	T, U
	Cloud Security	2	T
	Multicore Operating Systems	1	T

Examination forms	Short-answer questions, Programming 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. Rountree, Derrick, and Ileana Castrillo. *The basics of cloud computing: Understanding the fundamentals of cloud computing in theory and practice*. Newnes, 2013. 2. Patterson, Scott. Learn AWS Serverless Computing: A Beginner's Guide to Using AWS Lambda, Amazon API Gateway, and Services from Amazon Web Services. Packt Publishing Ltd, 2019.

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

CLO\SLOT	1	2	3	4	5	6
1	X					
2		XX				
3						X

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction to Cloud Computing	1	Quiz	Lecture	1
2	Cloud Computing Platforms – Part 1	1	Quiz	Lecture	1
3	Cloud Computing Platforms – Part 2	1	Quiz	Lecture, Discussion, In-class Exercise	2

4	Cloud Computing Platforms – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
5	Parallel Programming in the Cloud – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
6	Parallel Programming in the Cloud – Part 2	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	2
7	Parallel Programming in the Cloud – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
8	Distributed Storage Systems – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
Midterm					
9	Distributed Storage Systems – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
10	Distributed Storage Systems – Part 3	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
11	Virtualization – Part 1	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
12	Virtualization – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion,	1

				In-class Exercise	
13	Cloud Security – Part 1	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1, 2
14	Cloud Security – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
15	Multicore Operating Systems	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
Final					

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Quiz / Assigment (10%)	50%	10%	10%
Labs (20%)	10%	30%	30%
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	10%	30%	30%

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

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	Identifies own and others' assumptions and several relevant contexts when	Questions some assumptions. Identifies several relevant contexts when	Shows an emerging awareness of present assumptions

	and carefully evaluates the relevance of contexts when presenting a position.	presenting a position.	presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	(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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications)	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications)

	discussed in priority order.	are identified clearly.	and implications) are identified clearly.	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	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 presentation is	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.

	appropriate to audience.	appropriate to audience.	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	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	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	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

	establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Entrepreneurship

Course Code: IT120IU

1. General information

Course name	- (in English): Entrepreneurship - (in Vietnamese): Khởi Nghiệp
Course designation	An introduction to the creative and innovative managerial practices of successful entrepreneurship.
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	7
Person responsible for the course	MSc. Dao Tran Hoang Chau
Language	English
Relation to curriculum	Compulsory (CS, NE, CE) Elective (DS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 127.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours Private study including examination preparation, specified in hours: 90 hours
Credit points	3 credits (Theory: 3 + Practice: 0) 4.64 ECTS

Number of periods	Theory: 45 Practice: 0
Required and recommended prerequisites for joining the course	None
Course objectives	This course reviews the significant economic and social contributions entrepreneurs provide to society, the intense lifestyle commitment, and the skills necessary for entrepreneurial success. It explores how to identify and develop solutions to the most common leadership and personal challenges faced by entrepreneurs when starting new ventures or launching new products. It also promotes a deeper understanding of what is required to be a successful entrepreneur, highlights the skills and tools necessary to start a new business and explores alternatives to common pitfalls. This course applies entrepreneurial marketing approaches used by successful entrepreneurs. These include utilizing industry sector trends, identifying emerging customer niches, developing new products/services, using guerilla marketing strategies, and Internet and social marketing strategies. It emphasizes the importance of managing cash flows, ratio analysis, pro forma development, and the basics of deal structure and harvesting a business venture. Students will identify and interpret sources of information from company financial reports, financial publications, industry benchmarks, the media, and web sites. An introduction to the process of researching, writing, and presenting a business plan. Students identify and screen ideas using a business feasibility study that describes the product features, market opportunity, customer profile, sales forecast, competitive advantage, and profit potential. Following a successful feasibility study, students may use business plan software as each develops their own complete business plan.
Course learning outcomes	CLO 1. Understand entrepreneurial processes; CLO 2. Apply new technology to boost business performance; CLO 3. Manage marketing strategy and financial statements in a enterprise;

Competency level	**Course learning outcome (CLO)**	
Knowledge	1, 2, 3	
Skill	1, 3	
Attitude	3	

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**
Entrepreneurship, Creativity and Innovation;	3	I, T
Creative Problem Solving Model;	3	T, U
Develop a Product. Generate Ideas and Protect Inventions;	2	T
Marketing Strategies;	3	T, U
Finance and Accounting	4	T, U

Examination forms

Multiple-choice questions, 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. Duening & Hisrich & Lechter, Technology Entrepreneurship 2nd, 2014

2. Learning Outcomes Matrix

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		

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Entrepreneurship, Creativity and Innovation;	1	Midterm exam	Lecture, In-class activities, Quiz	
2	Creative Problem Solving Model;	1	Midterm exam	Lecture, In-class activities, Quiz	
3	Develop a Product. Generate Ideas and Protect Inventions;	2	Midterm exam, Assignment	Lecture, In-class activities, Project	
4	Midterm				
5	Marketing Strategies;	3	Final exam, Assignment	Lecture, Project	
6	Finance and Accounting	3	Final exam, Assignment	Lecture, Project	
7	**Final exam**				

4. **Assessment plan**

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

2.

Assessment Type	CLO 1	CLO 2	CLO 3
Midterm examination (25%)	50%	50%	
Projects/Presentations/ Report (25%)			60%
Final examination (40%)			40%
Exercises/ Quiz (10%)	50%	50%	

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	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

			taken as 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 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	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or

	supports the presentation or establishes the presenter's credibility/ authority on the topic.	information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Optimization and Applications

Course Code: IT163IU

1. General information

Course name	- (in English): Optimization and Applications - (in Vietnamese): Tối Ưu Hóa và Ứng Dụng
Course designation	This subject covers linear programming, convex optimization theory, and applications.
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	6 or 7
Person responsible for the course	Assoc. Prof. Vo Thi Luu Phuong, Ph.D.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours Private study including examination preparation, specified in hours: 120 hours
Credit points	4 credits (Theory: 3 + Practice: 1) 6.18 ECTS
Number of periods	Theory: 45 Practice: 30

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td>None</td></tr>
<tr><td>Course objectives</td><td>Optimization, particularly convex optimization, is applied in many fields such as data science, computer science, economics, engineering, logistics, etc. Optimization models of various applications in machine learning, resource allocations, etc. are introduced. Background theory of iterative algorithms solving problems such as gradient descent, mini-batch stochastic gradient descent, subgradient method, proximal gradient descent, etc. are taught.
The course also covers linear programming (LP) which is a subfield of convex optimization. Some LP applications such as max flow – min cut, transportation, shortest path,… problems are mentioned.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Formulate a practical problem as an optimization model and solve it using optimization solvers.
CLO 2. Understand the background theory of convex problem, duality, and iterative algorithms solving the problems.
CLO 3. Be able to develop computer programs that applied iterative algorithms such as gradient descent, stochastic gradient descent, proximal gradient descent, subgradient method, … to solve optimization problems in various applications.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1, CLO2</td></tr>
<tr><td>Skill</td><td>CLO3</td></tr>
<tr><td>Attitude</td><td></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 (hours)
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Course introduction
Mathematical background (linear algebra and calculus)</td><td>1</td><td>I, T</td></tr>
</table></td></tr>
</table>

	Linear program and applications	2	I, T, U
	Integer linear program and its applications	1	I, T
	Convex sets and convex functions	1	I, T
	Convex problems.	1	I, T, U
	Some applications: - Linear regression - Classification - Regularization: Ridge regression, Lasso regression	1	I, T, U
	First-order methods: - gradient descent - subgradient - stochastic gradient - proximal gradient	2	I, T, U
	Duality - Lagrange, duality gap - KKT condition - Dual problem	2	I, T
	Dual-based methods: - Dual decomposition - Dual of support vector machine problem	1	I, U, T
	Second-order methods: - Newton method - Log-barrier method	1	I, U, T
	Advanced topic in optimization	1	I, U
	Final review	1	U
Examination forms	Multiple-choice questions, short-answer questions, programming		
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. Stephen P. Boyd and Lieven Vandenberghe. Convex optimization. Cambridge university press, 2004. 2. Robert J. Vanderbei. Linear programming: foundations and extensions, 5th edition. Springer Nature, 2020.

2. Learning Outcomes Matrix

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		XX				
2	XX					
3						X

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Course introduction	2		lecture	1, 2
2	Mathematical background (linear algebra and calculus)	2		lecture	1
3-4	Linear program and applications	1, 2	Midterm, homework, lab	lecture, exercises, lab	2
5	Integer linear program and its applications	1, 2	Midterm, homework	lecture, exercises	2
6	Convex sets and convex functions	1, 2	Midterm, homework	lecture, exercises	1
7	Some applications: - Linear regression - Classification - Regularization: Ridge regression, Lasso regression	1	Midterm, homework, lab	lecture, exercises, lab	1, 2
	Midterm				
8-10	First-order methods: - gradient descent - subgradient - stochastic gradient - proximal gradient	2, 3	Final, homework, lab	lecture, exercises, lab	1

11	Duality - Lagrange, duality gap - KKT condition - Dual problem	2	Final, homework	lecture, exercises	1
12	Dual-based methods: - Dual decomposition - Dual of support vector machine problem	2, 3	Final, homework, lab	lecture, exercises, lab	1
13	Second-order methods: - Newton method - Log-barrier method	2, 3	Final, homework, lab	lecture, exercises, lab	1
14	Advanced topic in optimization	2	Final, homework	lecture, exercises	Literature
15	Final review	1		lecture	
14	**Final exam**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Labs (25%)	25%		50%
Midterm examination (30%)	25%	40%	
Final examination (35%)	25%	40%	25%
Homeworks (10%)	25%	20%	25%

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

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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.↩

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	Conclusions and related outcomes (consequences and implications) are logical and reflect student’s informed	Conclusion is logically tied to a range of information, including opposing	Conclusion is logically tied to information (because information is chosen to fit the	Conclusion is inconsistently tied to some of the information discussed;

consequences)	evaluation and ability to place evidence and perspectives discussed in priority order.	viewpoints; related outcomes (consequences and implications) are identified clearly.	desired conclusion); some related outcomes (consequences and implications) are identified clearly.	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	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 choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not

	presentation is appropriate to audience.	appropriate to audience.	Language in presentation is appropriate to audience.	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/	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	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

		authority on the topic.	presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Discrete Mathematics

Course Code: IT153IU

1. General information

Course name	- (in English): Discrete Mathematics - (in Vietnamese): Toán Rời Rạc
Course designation	The course provides students the ability to reason and think mathematically and logically; and apply this ability to analyze and solve discrete practical problems in Computer Science and IT.
Course type	□ *General knowledge* □ *Fundamental* ☑ *Specialized knowledge* □ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	4
Person responsible for the course	Assoc. Prof. Nguyen Van Sinh
Language	English
Relation to curriculum	Compulsory (NE, CE, CS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 127.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours Private study including examination preparation, specified in hours: 90 hours
Credit points	3 credits (Theory: 3 + Practice: 0)

<table>
<tr><td></td><td>4.64 ECTS</td></tr>
<tr><td>Number of periods</td><td>Theory: 45
Practice: 0</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Calculus 1
Fundamental of Programming</td></tr>
<tr><td>Course objectives</td><td>This course provides students the based knowledge of discrete mathematics. To develop the ability to reason and think mathematically and logically; and to apply this ability to analyzing and solving discrete practical problems in computer science. This is an application-oriented course based upon the study of events that occur in small, or discrete in computer science, segments in business, industry, government and the digital areas. Students will be introduced to the mathematical tools of logic and set theory, counting, number theory, and graph theory. Practical applications will be introduced throughout the course</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Understand and apply count/enumerate objects in a systematic way.
CLO 2. Understand mathematical reasoning in order to read, comprehend and construct mathematical arguments; Understand to work with discrete structures and practical problems in computer science and IT
CLO 3. Apply algorithm thinking and modeling; Apply knowledge in computer science for problems solving
CLO 4. Have a sense of preparation of good mathematical knowledges to approach and solve problems in computer science and information technology.

<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1, CLO2</td></tr>
<tr><td>Skill</td><td>CLO2, CLO3</td></tr>
<tr><td>Attitude</td><td>CLO4</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 teaching hours)</td></tr>
</table>

<table>
<tr><td></td><td>Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Week 1: Course syllabus and introduction; Logic and propositions</td><td>3</td><td>I,T</td></tr>
<tr><td>Week 2: Logic and propositions (continue)</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 3: Propositional Equivalences; predicates and quantifiers</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 4: Nested Quantifiers and Methods of Proof</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 5: Induction and recursion</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 6&7: Number of theory</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 8: Counting: part 1, 2; midterm review</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 9: Counting: part 3</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 10: Advanced counting</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 11: Boolean algebras</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 12: Graph theory</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 13: Optimal problem solving on graphs</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 14: Introduction and application of tree</td><td>3</td><td>I,T,U</td></tr>
<tr><td>Week 15: Search on tree; review for final exam</td><td>3</td><td>I,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>
<tr><td>Reading list</td><td>1. Kenneth H. Rosen, Discrete Mathematics and Its Applications 8th edition, 2019.
2. Oscar Levin, Discrete mathematics An Open Introduction. 3rd edition, 2019.
3. Vietnamese book: N.V.Sinh, T.M.Hà, N.T.T.Sang, N.M.Quân, “Nền tảng Toán học trong Công nghệ Thông tin”, NXB - Đại học Quốc gia TPHCM, ISBN: 978-604-73-6518-0, 2018.</td></tr>
</table>

2. Learning Outcomes Matrix

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				
4						X

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Course syllabus and introduction; Logic and propositions	1,2	Questions and answers	Lecture, Discussion, In-class exercises	[1, 2]
2	Logic and propositions (continue)	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
3	Propositional Equivalences; predicates and quantifiers	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
4	Nested Quantifiers and Methods of Proof	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
5	Induction and recursion	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
6	Number of theory	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
7	Number of theory (continue)	2,3,4	Quiz, Homework,	Lecture, Discussion,	[1, 2]

			Midterm exam	In-class exercises	
8	Counting: part 1, 2; midterm review	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
	Midterm examination				
9	Counting: part 3	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2]
10	Advanced counting	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2]
11	Boolean algebras	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
12	Graph theory	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
13	Optimal problem solving on graphs	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
14	Introduction and application of tree	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
15	Search on tree; review for final exam	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]

1	**Final examination**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Quiz/Homework/Assignment (25%)	20%	30%	30%	20%
Midterm examination (30%)	25%	25%	25%	25%
Final examination (45%)		30%	40%	30%

Note: %Pass: Target that % of students have 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*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive	Information is taken from source(s) with enough interpretation/	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a	Information is taken from source(s) without any interpretation

investigate a point of view or conclusion	analysis or synthesis. Viewpoints of experts are questioned thoroughly.	evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	/ 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	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

	position (perspective, thesis/ hypothesis).	(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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently	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.

	the content of the presentation cohesive.	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,	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from	Insufficient 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.	relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Internship

Course Code: IT082IU

1. General information

Course name	- (in English): Internship - (in Vietnamese): Thực Tập Công Nghiệp
Course designation	This course helps students to do an internship in industry and prepare a topic for a pre-thesis and thesis
Course type	□ *General knowledge* □ *Fundamental* □ *Specialized knowledge* ☑ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	7
Person responsible for the course	Lecturer of School of Computer Science and Engineering; Advisor of the Company/Organization (in Industry)
Language	English
Relation to curriculum	Compulsory
Teaching methods	Project, seminar, self-study
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 135 hours
Credit points	3 credits (Theory: 0 + Practice: 3) 4.91 ECTS

<table>
<tr><td>Number of periods</td><td>Theory: 0
Practice: 0</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Follows requirements of the academic program</td></tr>
<tr><td>Course objectives</td><td>This course requires students to work in IT-related organizations or businesses from June to September. Each student has supervised by a faculty member at the SCSE and an instructor at the organization. The student will join/run a technical project, and/or participate in soft skills courses. The internship lasts a minimum of 8 weeks and 3 sessions per week. Students have to report progress to instructors after 3 weeks of receiving the project. Depending on the project requirements of the organization or business, students may arrange for a longer time. At the end of the internship, students will submit internship reports and assessment reports from the instructor at the organization or business to the School. Instructors read the reports and confirm the internship marks for the students. Students can also register this course in main semesters or take part in internships abroad for a period of 6 months. The registration and evaluation process are similar.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Recognize the roles of an engineer in practical environment.
CLO 2. Develop practical products or run product development projects in industry
CLO 3. Follow requirements/regulations and laws
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1, CLO2</td></tr>
<tr><td>Skill</td><td>CLO1, CLO2</td></tr>
<tr><td>Attitude</td><td>CLO3</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: within 3 months
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Introduction of the internship place</td><td>9</td><td>U</td></tr>
<tr><td>Review the existing issues of an assigned project</td><td>9</td><td>U</td></tr>
</table></td></tr>
</table>

	Study and solve some issues in product development	9	U
	Implement some new functions or features for the project product	9	U
	Presentation	9	U
Examination forms	Presentation		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the requirement of the company or business. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Students must have more than 50/100 points overall to pass this course.		
Reading list	By on the suggestion of the company or business		

2. Learning Outcomes Matrix

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

	SLO					
CLO	1	2	3	4	5	6
1		xx				xx
2		x				x
3				x	x	

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Introduction of the internship place	1,2	Check and Evaluate	Research and working	At company or organization
3	Review the existing issues of an assigned project	1,2	Check and Evaluate	Research and working	At company or organization
4	Study and solve some issues in product development	1,2	Check and Evaluate	Research and working	At company or organization
5	Implement some new functions or features for the project product	1,2	Check and Evaluate	Research and working	At company or organization
6	Presentation	1,2,3	Check and Evaluate	Research and working	At company or organization

7	**Final grade**				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Final grade (100%)	30%	40%	30%

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	Information is taken from source(s) with enough interpretation/ evaluation to develop a	Information is taken from source(s) with some interpretation/ evaluation, but not enough to	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of

	analysis or synthesis. Viewpoints of experts are questioned thoroughly.	coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	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	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.

	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	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.

	presentation cohesive.			
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,	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from	Insufficient 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.	relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Special Study of the Field

Course Code: IT083IU

1. General information

Course name	- (in English): Special Study of the Field - (in Vietnamese): Đồ Án
Course designation	This course helps students to do a research topic and prepare for a thesis
Course type	□ *General knowledge* □ *Fundamental* □ *Specialized knowledge* ☑ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	7
Person responsible for the course	Lecturers (thesis advisor)
Language	English
Relation to curriculum	Compulsory
Teaching methods	Project, seminar, self-study
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 135 hours
Credit points	3 credits (Theory: 0 + Practice: 3) 4.91 ECTS
Number of periods	Theory: 0 Practice: 0

<table>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Required number of credits</td></tr>
<tr><td>Course objectives</td><td>Students are advised to select a subject under the guidance of a faculty member. Project content might be a research topic or building a new application that underlies the graduation thesis. Research topics include fields of academic program that are academic or practical.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Research a specific topic in the field.
CLO 2. Design the model or system architecture of the application product
CLO 3. Have a good preparation to develop and improve the product in the thesis.

<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1</td></tr>
<tr><td>Skill</td><td>CLO1, CLO2</td></tr>
<tr><td>Attitude</td><td>CLO3</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: in the whole semester.
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Find out/define a topic of the subject</td><td>3</td><td>U</td></tr>
<tr><td>Review and evaluate existing issues/problems</td><td>8</td><td>U</td></tr>
<tr><td>Research and propose some solutions</td><td>8</td><td>U</td></tr>
<tr><td>Deploy some main functions or new features for the product project</td><td>8</td><td>U</td></tr>
<tr><td>Testing and evaluating solutions or products</td><td>8</td><td>U</td></tr>
<tr><td>Write a report</td><td>10</td><td>U</td></tr>
</table></td></tr>
<tr><td>Examination forms</td><td>Presentation</td></tr>
<tr><td>Study and examination requirements</td><td>A minimum attendance of 80 percent is compulsory for the appointments with supervisor. Students will be assessed based on their contribution. Questions and comments are strongly encouraged.
Students must have more than 50/100 points overall to pass this course.</td></tr>
</table>

Reading list	Related works and books

2. Learning Outcomes Matrix

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

	SLO					
CLO	1	2	3	4	5	6
1		xx				
2		xx				xx
3			xx			

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Find out the topic of the subject	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
2	Review and evaluate existing issues	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
3	Research and propose some solutions	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
4	Deploy some main functions or new features for the product project	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
5	Testing and evaluating solutions or products	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
6	Write a report	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
7	**Final grade**				

4. Assessment plan

Assessment Type	**CLO1**	**CLO2**	**CLO3**
Final grade (100%)	30%	40%	30%

Note: %Pass: Target that % of students having scores greater than 60 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	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

			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	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.

	presentation cohesive.			
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,	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from

	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.	authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	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: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

VIETNAM NATIONAL UNIVERSITY HCMC

INTERNATIONAL UNIVERSITY

School of Computer Science and Engineering

COURSE SYLLABUS

Course Name: Thesis

Course Code: IT058IU

1. General information

Course name	- (in English): Thesis - (in Vietnamese): Luận Văn
Course designation	This course evaluates students obtained knowledges to complete the academic program.
Course type	□ *General knowledge* □ *Fundamental* □ *Specialized knowledge* ☑ *Internship/Project/Thesis* □ *Others:…….*
Semester(s) in which the course is taught	8
Person responsible for the course	Lecturers (thesis advisor)
Language	English
Relation to curriculum	Compulsory
Teaching methods	Project, seminar, self-study
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 450 hours
Credit points	10 credits (Theory: 0 + Practice: 10) 16.37 ECTS

<table>
<tr><td>Number of periods</td><td>Theory: 0
Practice: 0</td></tr>
<tr><td>Required and recommended prerequisites for joining the course</td><td>Required number of credits
Special Study of the Field</td></tr>
<tr><td>Course objectives</td><td>Dissertations are industrial projects designed to ensure that students have mastered their subjects in the program. All projects are based on "real projects" provided by the industry to students to develop skills and apply knowledge gained from all courses throughout the program. Students will work independently to develop requirements, design, implement and provide solutions to business problems. Students can follow any appropriate process model, must self-manage the project, follow all appropriate project management techniques. The success of the project is largely determined by whether the student adequately solves the client's problem. Students will provide the final product with all artifacts that match the process model being used (e.g. project plan, technical requirements, system architecture, design documentation, test plan, source code and installed software products). Or students can choose the basic research to do the thesis.</td></tr>
<tr><td>Course learning outcomes</td><td>CLO 1. Research a specific topic in the field.
CLO 2. Design the model or system architecture of the application product
CLO 3. Hard work to develop and finish the product of the thesis.
<table>
<tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr>
<tr><td>Knowledge</td><td>CLO1</td></tr>
<tr><td>Skill</td><td>CLO1, CLO2</td></tr>
<tr><td>Attitude</td><td>CLO3</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: in the whole last semester
Teaching levels: I (Introduce); T (Teach); U (Utilize)
<table>
<tr><th>Topic</th><th>Weight</th><th>Level</th></tr>
<tr><td>Find out the thesis topic</td><td>4</td><td>U</td></tr>
<tr><td>Review and evaluate existing issues</td><td>20</td><td>U</td></tr>
<tr><td>Research and propose some solutions</td><td>30</td><td>U</td></tr>
</table></td></tr>
</table>

		Deploy the thesis product	40	U	
		Testing and evaluating solutions or products	40	U	
		Thesis defense	1	U	
Examination forms	Defense				
Study and examination requirements	A minimum attendance of 80 percent is compulsory for the requirement. Students will be assessed on their contribution. Questions and comments are strongly encouraged. Students must have more than 50/100 points overall to pass this course.				
Reading list	Books and papers.				

2. Learning Outcomes Matrix

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

	SLO					
CLO	1	2	3	4	5	6
1	xxx	xxx				
2	xxx	xxx				xx
3			xx			

3. Planned learning activities and teaching methods

Week	**Topic**	**CLO**	**Assessments**	**Learning activities**	**Resources**
1	Find out the thesis topic	1,2	Check and evaluate	Discuss and Research	Related work, books and research papers
2	Review and evaluate existing issues	1,2	Check and evaluate	Discuss and Research	Related work, books and research papers
3	Research and propose some solutions	1,2	Check and evaluate	Discuss and Research	Related work, books and research papers
4	Deploy the thesis product	1,2	Check and evaluate	Discuss and Research	Related work, books and research papers

5	Testing and evaluating solutions or products	1,2	Check and evaluate	Discuss and Research	Related work, books and research papers
6	Thesis defense	1,2,3	By committee	presentation	

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Final grade (100%)	30%	40%	30%

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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and	Conclusion is inconsistently tied to some of the information discussed; related outcomes

	perspectives discussed in priority order.	implications) are identified clearly.	implications) are identified clearly.	(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	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

	presentation is appropriate to audience.	appropriate to audience.	presentation is appropriate to audience.	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 the presentation or establishes the presenter's	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or	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.	credibility/ authority on the topic.	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

Date revised: April 24, 2024

Ho Chi Minh City, 24/04/2024

Dean of the School of Computer Science and Engineering

(Signature)

Nguyen Van Sinh

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 (chỉ áp dụng cho CTĐT kỹ sư, CTĐT cử nhân vui lòng xóa trang này)

(Kèm theo Quyết định số /QĐ-ĐTĐH ngày tháng năm 2024 của Hiệu trưởng Trường Đại học Quốc tế)