

**CHƯƠNG TRÌNH ĐÀO TẠO KHÓA 2024 - NGÀNH HÓA HỌC
(CHƯƠNG TRÌNH HÓA SINH)
TRÌNH ĐỘ ĐẠI HỌC**

*(Kèm theo Quyết định số 761 /QĐ-ĐHQT ngày 09 tháng 7 năm 2024
của Hiệu trưởng Trường Đại học Quốc tế)*

1. Thông tin chung

- Tên ngành đào tạo:
- + Tiếng Việt: Hóa Học (Chương trình Hóa Sinh)
- + Tiếng Anh: Chemistry (Biochemistry program)
- Mã ngành đào tạo: 7440112
- Trình độ đào tạo: Đại học
- Loại hình đào tạo: Chính quy
- Thời gian đào tạo: 4 năm
- Tên văn bằng sau khi tốt nghiệp:
- + Tiếng Việt: Cử nhân Hóa Học (Chương trình Hóa sinh)
- + Tiếng Anh: Bachelor of Chemistry (Biochemistry program)
- Nơi đào tạo: Trường Đại học Quốc tế - Đại học Quốc gia TP.HCM

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, B00, B08, D07

d. Dự kiến chỉ tiêu tuyển sinh, quy mô đào tạo: 60 sinh viên

3. Mục tiêu đào tạo

a. Mục tiêu chung:

Chương trình đào tạo ngành Hoá học (chương trình Hóa sinh) tại Trường Đại học Quốc tế được thiết kế nhằm đào tạo các **Cử nhân** có kiến thức rộng và chuyên sâu trong lĩnh vực khoa học, nghiên cứu về bản chất, cấu trúc, tính chất lý hóa và biến đổi của vật chất trong cơ thể con người cũng như động thực vật. Sinh viên sẽ được cung cấp các kiến thức, kỹ năng chuyên môn, và thái độ cần thiết để trở thành những người hoạt động trong lĩnh vực Hoá sinh trong tương lai, có hiểu biết, trách nhiệm, đóng góp vào sự phát triển của bản thân, gia đình, và xã hội.

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

Mục tiêu cụ thể của chương trình đào tạo được xác định từ mục tiêu chung, bao gồm 4 mục tiêu:

- Mục tiêu 1: Đào tạo sinh viên có kiến thức cơ bản về toán học, khoa học tự nhiên và xã hội để sẵn sàng tham gia lực lượng lao động quốc tế, đáp ứng nhu cầu phát triển kinh tế, công nghiệp hóa, hiện đại hóa đất nước.
- Mục tiêu 2: Đào tạo sinh viên có kiến thức lý thuyết và thực hành, vững vàng về chuyên môn, có đạo đức nghề nghiệp; có kỹ năng quản lý, tư duy phản biện, giao tiếp và làm việc nhóm đa lĩnh vực.
- Mục tiêu 3: Đào tạo sinh viên có khả năng làm việc trong các tổ chức nghề nghiệp như nhà máy, viện nghiên cứu, bệnh viện, trường đại học, trung học phổ thông cũng như trong các cơ quan, doanh nghiệp ở lĩnh vực liên quan như mỹ phẩm, dinh dưỡng, công nghệ sinh học, nông nghiệp, môi trường, thực phẩm và dược phẩm,...
- Mục tiêu 4: Đào tạo sinh viên có đầy đủ kiến thức, thái độ, trách nhiệm và tinh thần học tập suốt đời, sẵn sàng tiếp tục học lên các chương trình cao học của các ngành khoa học như hóa sinh, hóa học, công nghệ sinh học... ở Việt Nam hoặc nước ngoài.

Bảng 1.1. 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 CTĐT
Luật giáo dục đại học 2012	Có kiến thức chuyên môn toàn diện, nắm vững nguyên lý, quy luật tự nhiên - xã hội	PO1, PO2, PO4
	Có kỹ năng thực hành cơ bản	PO2, PO3
	Có khả năng làm việc độc lập, sáng tạo và giải quyết những vấn đề thuộc ngành được đào tạo	PO2, PO3
Tầm nhìn của Đại học Quốc tế	Trường ĐHQT là trường đại học nghiên cứu thuộc топ 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.	PO1-PO4
Sứ mạng của Đại học Quốc tế	Là CSGD quốc tế, mang bản sắc văn hóa Việt Nam.	PO1, PO4
	CSGD đại học đi tiên phong trong đổi mới cơ chế quản trị đại học theo mô hình tự chủ và tiên tiến.	PO1
	Đào tạo chất lượng cao đa ngành – đa lĩnh vực. Đạt chuẩn kiểm định chất lượng giáo dục theo tiêu chuẩn quốc tế/khu vực cho tất cả các CTĐT.	PO3, PO4

	Giảng dạy và nghiên cứu thực hiện bằng tiếng Anh là điểm khác biệt nâng tầm quốc tế của nhà trường. SV được đào tạo và rèn luyện để trở thành công dân toàn cầu và có trách nhiệm với xã hội, dẫn dắt xã hội trong tương lai.	PO1, PO4
	Nghiên cứu cơ bản với hàm lượng tri thức lớn song hành với nghiên cứu ứng dụng, đáp ứng yêu cầu đổi mới sáng tạo và phát triển bền vững của doanh nghiệp, địa phương và xã hội; quan tâm, thúc đẩy các hoạt động kết nối và PVCD.	PO2, PO3

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

Từ các mục tiêu cụ thể nêu trên, cùng với việc tham khảo chuẩn đầu ra của các cơ sở đào tạo có chương trình Hóa Sinh trên thế giới, chuẩn đầu ra của ngành Hóa học (chương trình Hóa sinh) tại trường Đại học Quốc Tế đã được xây dựng gồm các tiêu chuẩn như dưới đây. Theo đó, sinh viên sau khi hoàn tất chương trình đào tạo, có thể:

1. Xác định được các kiến thức cơ bản liên quan đến Hóa sinh thuộc lĩnh vực toán học, kinh tế, xã hội và khoa học tự nhiên. **(Kiến thức chung)**
2. Thể hiện được năng lực về phương pháp luận và ứng dụng năng lực đó trong các ngành nghề khác nhau để xác định và giải quyết các vấn đề cụ thể một cách hiệu quả. **(Kỹ năng chung)**
3. Có được kiến thức cơ bản và chuyên sâu thuộc các chuyên ngành trong lĩnh vực Hóa sinh. **(Kiến thức chuyên môn)**
4. Thực hiện được các công việc về thực nghiệm một cách độc lập và an toàn trong phòng thí nghiệm thuộc lĩnh vực Hóa sinh và các lĩnh vực liên quan; và có khả năng thu thập, giải thích và đánh giá các dữ liệu khoa học. **(Kỹ năng chuyên môn)**
5. Tuân thủ các nguyên tắc pháp lý cơ bản, các quy định về môi trường, về an toàn và đạo đức trong công việc, về trách nhiệm của bản thân. **(Thái độ)**
6. Thực hiện được các đề tài nghiên cứu, ứng dụng kỹ thuật hiện đại trong phát triển các sản phẩm thuộc lĩnh vực hóa sinh. **(Ứng dụng)**
7. Nhận biết được yêu cầu, tích cực thực hiện việc học tập suốt đời và có sự chuẩn bị đầy đủ cho nghề nghiệp trong tương lai. **(Học tập suốt đời)**
8. Tham gia trong các nhóm làm việc liên ngành, có kỹ năng giao tiếp, lãnh đạo và quản lý. **(Phát triển)**

Bảng 1.2. Đối chiếu CDR của CTĐT ngành Hóa học (chương trình Hóa sinh) và CDR theo Khung trình độ Quốc gia Việt Nam - Bậc 6 (theo QĐ số 1982/QĐ-TTg ngày 18 tháng 10 năm 2016 của Thủ tướng Chính phủ)

	Khung trình độ Quốc gia Việt Nam (bậc 6)	CDR CTĐT
Kiến thức		

	Khung trình độ Quốc gia Việt Nam (bậc 6)	CĐR CTĐT
K1	- Kiến thức thực tế vững chắc, kiến thức lý thuyết sâu, rộng trong phạm vi của ngành đào tạo.	PLO1, PLO3
K2	- Kiến thức cơ bản về khoa học xã hội, khoa học chính trị và pháp luật. - Kiến thức về CNTT đáp ứng yêu cầu công việc.	PLO1, PLO5
K3	- Kiến thức về lập kế hoạch, tổ chức và giám sát các quá trình trong một lĩnh vực hoạt động cụ thể. - Kiến thức cơ bản về quản lý, điều hành hoạt động chuyên môn.	PLO8
Kỹ năng		
S1	- Kỹ năng phản biện, phê phán và sử dụng các giải pháp thay thế trong điều kiện môi trường không xác định hoặc thay đổi. - Kỹ năng truyền đạt vấn đề và giải pháp tới người khác tại nơi làm việc; chuyển tải, phổ biến kiến thức, kỹ năng trong việc thực hiện những nhiệm vụ cụ thể hoặc phức tạp. - Có năng lực ngoại ngữ bậc 3/6 Khung năng lực ngoại ngữ của Việt Nam.	PLO2, PLO8
S2	- Kỹ năng cần thiết để có thể giải quyết các vấn đề phức tạp. - Kỹ năng dẫn dắt, khởi nghiệp, tạo việc làm cho mình và cho người khác. - Kỹ năng đánh giá chất lượng công việc sau khi hoàn thành và kết quả thực hiện của các thành viên trong nhóm.	PLO2, PLO4, PLO6, PLO7, PLO8
Mức độ tự chủ và trách nhiệm		
A1	- Hướng dẫn, giám sát những người khác thực hiện nhiệm vụ xác định. - Lập kế hoạch, điều phối, quản lý các nguồn lực, đánh giá và cải thiện hiệu quả các hoạt động - Làm việc độc lập hoặc làm việc theo nhóm trong điều kiện làm việc thay đổi, chịu trách nhiệm cá nhân và trách nhiệm đối với nhóm.	PLO7, PLO8
A2	- Tự định hướng, đưa ra kết luận chuyên môn và có thể bảo vệ được quan điểm cá nhân.	PLO2, PLO7

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

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

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

	PLOs ⁽¹⁾	POs ⁽²⁾			
		PO1	PO2	PO3	PO4
Kiến thức	PLO1	x		x	x
	PLO3		x	x	x
Kỹ năng	PLO2		x	x	x
	PLO4		x	x	
	PLO6		x		x
Tự chủ và trách nhiệm	PLO5		x	x	
	PLO7	x			x
	PLO8		x	x	x

6. Quy trình đào tạo, điều kiện tốt nghiệp

Căn cứ Quyết định số 1342/QĐ-ĐHQG ngày 30 tháng 9 năm 2022 của Giám đốc Đại học Quốc gia Thành phố Hồ Chí Minh về việc ban hành Quy chế đào tạo trình độ đại học.

Căn cứ Quyết định số 719/QĐ-ĐHQT ngày 06 tháng 12 năm 2021 của Hiệu trưởng trường Đại học Quốc tế về việc ban hành Quy chế đào tạo trình độ đại học theo hệ thống tín chỉ tại trường Đại học Quốc tế.

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

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

Bảng 3: Thang điểm

Xếp loại	Thang điểm 100	Thang điểm 10	Thang điểm 4	Thang điểm chữ
Đạt				
Xuất sắc	$90 \leq \text{ĐTBTL} \leq 100$	$9,0 \leq \text{ĐTBTL} \leq 10$	4,0	A ⁺
Giỏi	$80 \leq \text{ĐTBTL} < 90$	$8,0 \leq \text{ĐTBTL} < 9,0$	3,5	A
Khá	$70 \leq \text{ĐTBTL} < 80$	$7,0 \leq \text{ĐTBTL} < 8,0$	3,0	B ⁺
Trung bình khá	$60 \leq \text{ĐTBTL} < 70$	$6,0 \leq \text{ĐTBTL} < 7,0$	2,5	B
Trung bình	$50 \leq \text{ĐTBTL} < 60$	$5,0 \leq \text{ĐTBTL} < 6,0$	2,0	C
Không đạt				
Yếu	$40 \leq \text{ĐTBTL} < 50$	$4,0 \leq \text{ĐTBTL} < 5,0$	1,5	D ⁺
Kém	$30 \leq \text{ĐTBTL} < 40$	$3,0 \leq \text{ĐTBTL} < 4,0$	1,0	D
	$\text{ĐTBTL} < 30$	$\text{ĐTBTL} < 3,0$	0,0	F

8. Khối lượng kiến thức toàn khoá

Tổng số tín chỉ: 138 tín chỉ, trong đó phân bổ kiến thức như Bảng 4 (không bao gồm giáo dục thể chất và giáo dục quốc phòng)

Bảng 4. Cấu trúc chương trình đào tạo

STT	Các khối kiến thức ⁽³⁾	Khối lượng	
		Số tín chỉ	%
I	Khối kiến thức giáo dục đại cương	66	47.82
II	Khối kiến thức cơ sở ngành	43	31.16
III	Kiến thức chuyên ngành	12	8.70
IV	Kiến thức bổ trợ	3	2.17
V	Thực tập, khóa luận/luận văn tốt nghiệp	14	10.14
	Tổng cộng	138	100

9. Nội dung chương trình đào tạo

Bảng 5. Các môn học thuộc CTĐT

STT	Mã MH	Tên môn học (MH)		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Phòng TN (**)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
I	Kiến thức giáo dục đại cương				66	59	7	
	Lý luận chính trị			Bắt buộc	14	14	0	
1	PE015IU	Triết học Mac-Lenin	Philosophy of Marxism and Leninism	Bắt buộc	3	3	0	
2	PE016IU	Kinh tế chính trị Mác-Lenin	Political economics of Marxism and Leninism	Bắt buộc	2	2	0	
3	PE017U	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	
4	PE018IU	Lịch sử ĐCSVN	History of Vietnamese Communist Party	Bắt buộc	2	2	0	
5	PE019U	Tư tưởng HCM	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0	

STT	Mã MH	Tên môn học (MH)		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Phòng TN (**)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
6	PE021IU	Pháp luật Đại cương	General Law	Bắt buộc	3	3	0	
Khoa học xã hội - Nhân văn - Nghệ thuật-Ngoại ngữ					11	11	0	
7	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
8	EN007IU, EN008IU	Anh văn chuyên ngành 1	Academic English 1	Bắt buộc	4	4	0	
9	EN011IU, EN012IU	Anh văn chuyên ngành 2	Academic English 2	Bắt buộc	4	4	0	
Giáo dục Thể chất					6			
10	PT001IU	Thể dục 1	Physical Training 1	Bắt buộc	3	3	0	
11	PT002IU	Thể dục 2	Physical Training 2	Bắt buộc	3	3	0	
Toán - Tin học - Khoa học tự nhiên - Công nghệ - Môi trường				Bắt buộc	41	34	7	
12	MA001IU	Toán cao cấp 1	Calculus 1	Bắt buộc	4	4	0	
13	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
14	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	
15	BT362IU	Hóa đại cương	Chemistry for Engineers	Bắt buộc	3	3	0	
16	BT311IU	Sinh học đại cương	Biology	Bắt buộc	3	3	0	
17	BT312IU	Thực hành sinh học đại cương	Practice in biology	Bắt buộc	1	0	1	LA1.709
18	BTBC103IU	Hóa Vô Cơ	Inorganic Chemistry	Bắt buộc	3	3	0	
19	BTBC104IU	Thực hành Hóa vô cơ	Inorganic Chemistry lab	Bắt buộc	1	0	1	LA1.502

STT	Mã MH	Tên môn học (MH)		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Phòng TN (**)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
20	BTBC201IU	Hóa hữu cơ 1	Organic Chemistry 1	Bắt buộc	3	3	0	
21	BTBC206IU	Hóa hữu cơ 2	Organic Chemistry 2	Bắt buộc	3	3	0	
22	BTBC207IU	Thực hành Hóa hữu cơ	Organic Chemistry lab	Bắt buộc	2	0	2	LA1.502
23	BTBC213IU	Nguyên lý hóa phân tích	Fundamentals of Analytical Chemistry	Bắt buộc	3	3	0	
24	BTBC214IU	Thực hành Nguyên lý hóa phân tích	Fundamental in analytical chemistry lab	Bắt buộc	1	0	1	LA1.502
25	BTBC215IU	Phân tích dụng cụ	Instrumental Analysis	Bắt buộc	3	3	0	
26	BTBC216IU	Thực hành Phân tích dụng cụ	Instrumental analysis lab	Bắt buộc	1	0	1	LA1.502
27	PE014IU	Khoa học môi trường	Environmental Science	Bắt buộc	3	3	0	
28	BT317IU	Thống kê sinh học	Biostatistics	Bắt buộc	2	2	0	
29	BT318IU	Thực hành thống kê sinh học	Practice in Biostatistics	Bắt buộc	1	0	1	LA.302
Kinh tế - Quản lý								
II	Kiến thức cơ sở ngành				43	35	8	
30	BTBC102IU	Nhập môn chuyên ngành Hóa sinh	Introduction to Biochemistry	Bắt buộc	2	2	0	
31	BTBC217IU	Thiết kế thí	Experimental design and	Bắt buộc	3	3	0	

STT	Mã MH	Tên môn học (MH)		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Phòng TN (**)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
		nghiệm và kỹ năng báo cáo trong ngành kỹ thuật	technical communication					
32	BTBC209IU	Hóa sinh 1	Biochemistry 1	Bắt buộc	3	3	0	
33	BTBC211IU	Hóa sinh 2	Biochemistry 2	Bắt buộc	3	3	0	
34	BTBC212IU	Thực hành Hóa sinh 2	Biochemistry 2 lab	Bắt buộc	2	0	2	LA1.501
35	BT321IU	Vi sinh	Microbiology	Bắt buộc	3	3	0	
36	BT322IU	Thực hành Vi sinh	Practice in Microbiology	Bắt buộc	1	0	1	LA1.701
37	BTBC218IU	Sinh học phân tử của tế bào	Molecular Cell Biology	Bắt buộc	3	3	0	
38	BTBC219IU	Thực hành Sinh học phân tử của tế bào	Molecular Cell Biology Lab	Bắt buộc	1	0	1	LA1.701
39	BT337IU	Tin sinh học	Bioinformatics	Bắt buộc	3	3	0	
40	BT338IU	Thực hành tin sinh học	Practice in Bioinformatics	Bắt buộc	1	0	1	LA1.301
41	BTBC315IU	Enzyme học	Enzymology	Bắt buộc	3	3	0	
42	BTBC316IU	Thực hành Enzyme học	Enzymology lab	Bắt buộc	1	0	1	LA1.501
43	BTBC304IU	Sinh dược học	Biopharmaceutics	Bắt buộc	3	3	0	

STT	Mã MH	Tên môn học (MH)		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Phòng TN (**)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
44	BTBC302IU	Hóa lý sinh học	Biophysical Chemistry	Bắt buộc	3	3	0	
45	BTBC313IU	Kỹ thuật Hóa sinh	Methods in Biochemistry	Bắt buộc	3	3	0	
46	BTBC314IU	Thực hành Kỹ thuật Hóa sinh	Methods in Biochemistry lab	Bắt buộc	2	0	2	LA1.501
47	BT405IU	Hóa lý	Physical Chemistry	Bắt buộc	3	3	0	
III	Kiến thức chuyên ngành (tự chọn) chọn 3 môn (tối thiểu 12 tín chỉ)				12	9	3	
48	BTBC317IU	Hóa sinh dinh dưỡng	Nutritional Biochemistry	Tự chọn	3	3	0	
49	BTBC318U	Thực hành Hóa sinh dinh dưỡng	Nutritional Biochemistry Lab	Tự chọn	1	0	1	LA1.703
50	BTBC417IU	Liệu pháp dinh dưỡng	Nutrition Therapy	Tự chọn	3	3	0	
51	BTBC418IU	Thực hành Liệu pháp dinh dưỡng	Nutrition Therapy Lab	Tự chọn	1	0	1	LA1.703
52	BTBC419IU	Dinh dưỡng lâm sàng	Clinical Nutrition	Tự chọn	3	3	0	
53	BTBC420IU	Thực hành dinh dưỡng lâm sàng	Clinical Nutrition Lab	Tự chọn	1	0	1	LA1.703
54	BTBC408IU	Phát triển thuốc	Drug Development	Tự chọn	3	3	0	
55	BTBC423IU	Thực hành phát	Drug Development Lab	Tự chọn	1	0	1	

STT	Mã MH	Tên môn học (MH)		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Phòng TN (**)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
		triển thuốc						
56	BTBC409IU	Mỹ phẩm & mỹ dược 1	Comestics and Cosmeceuticals 1	Tự chọn	3	3	0	
57	BTBC410IU	Mỹ phẩm & mỹ dược 2	Comestics and Cosmeceuticals 2	Tự chọn	3	3	0	
58	BTBC411IU	Thực hành mỹ phẩm & mỹ dược	Comestics and Cosmeceuticals Lab	Tự chọn	2	0	2	LA1.703
59	BTBC421IU	Dưỡng dược	Nutraceuticals	Tự chọn	3	3	0	
60	BTBC422IU	Thực hành dưỡng dược	Nutraceuticals Lab	Tự chọn	1	0	1	LA1.703
61	BT335IU	Miễn dịch học	Immunology	Tự chọn	3	3	0	
62	BT336IU	Thực hành miễn dịch học	Practice in Immunology	Tự chọn	1	0	1	LA1.701
63	BTBC415IU	Công nghệ lên men	Fermentation Technology	Tự chọn	3	3	0	
64	BTBC416IU	Thực hành Công nghệ lên men	Fermentation Technology lab	Tự chọn	1	0	1	LA1.703
65	BTBC413IU	Hóa sinh lâm sàng	Clinical Biochemistry	Tự chọn	3	3	0	
66	BTBC414IU	Thực hành Hóa sinh lâm sàng	Clinical Biochemistry Lab	Tự chọn	1	0	1	**
67	BT210IU	Sinh lý người	Human Physiology	Tự chọn	3	3	0	

STT	Mã MH	Tên môn học (MH)		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Phòng TN (**)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
68	BTBC424IU	Hóa bề mặt	The chemistry of surfaces and interfaces	Tự chọn	3	3	0	
69	BT351IU	Chuẩn đoán phân tử	Molecular Diagnostics	Tự chọn	3	3	0	
IV	Kiến thức bổ trợ (tự chọn tối thiểu 3 tín chỉ)			Lựa chọn tự do	3	3	0	
70	IS050IU	Quản lý dự án	Project Management	Tự chọn	3	3	0	
71	BA164IU	Quản lý sản xuất	Production and Operation management	Tự chọn	3	3	0	
72	IS078IU	Kỹ thuật Thiết kế Chuỗi cung ứng và Logistics	Logistics Engineering and Supply Chain Design	Tự chọn	3	3	0	
V	Thực tập, khóa luận/luận văn tốt nghiệp			Bắt buộc	14	0	14	
73	BTBC309IU	Thực tập ngành nghề	Internship	Bắt buộc	2	0	2	
74	BT179IU	Khóa luận tốt nghiệp	Thesis	Bắt buộc	12	0	12	
	Tổng số (tín chỉ)				138	106	32	

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 6, Bảng 7, Bảng 8 và Bảng 9.

10.1. Trình độ AE1

Bảng 6. 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)/ Môn học học trước (HT)/ Môn học song hành (SH)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
I (17 tín chỉ)	MA001IU	Toán cao cấp 1	Calculus 1	Bắt buộc	4	4	0	
	BT311IU	Sinh học đại cương	Biology	Bắt buộc	3	3	0	
	BT312IU	Thực hành sinh học đại cương	Practice in Biology	Bắt buộc	1	0	1	
	BT362IU	Hóa đại cương	Chemistry for Engineers	Bắt buộc	3	3	0	
	EN007IU, EN008IU	Anh văn chuyên ngành 1	AE 1	Bắt buộc	4	4	0	
	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	PT001IU	Thể dục 1	Physical Training 1	Bắt buộc	3	0	3	
II (18 tín chỉ)	EN011IU, EN012IU	Anh văn chuyên ngành 2	AE 2	Bắt buộc	4	4	0	
	BT317IU	Thống kê sinh học	Biostatistics	Bắt buộc	2	2	0	
	BT318IU	Thực hành thống kê sinh học	Practice in Biostatistics	Bắt buộc	1	0	1	SH: BT317IU
	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
	BTBC103IU	Hóa Vô Cơ	Inorganic Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC104IU	Thực hành Hóa vô cơ	Inorganic Chemistry lab	Bắt buộc	1	0	1	SH: BTBC103IU
	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BTBC102IU	Nhập môn chuyên ngành Hóa sinh	Introduction to Biochemistry	Bắt buộc	2	2	0	
	PT002IU	Thể dục 2	Physical Training 2	Bắt buộc	3	0	3	
	PE015IU	Triết học Mac-Lenin	Philosophy of Marxism and Leninism	Bắt buộc	3	3	0	
SUMMER HKII (5 tín chỉ)	PE016IU	Kinh tế chính trị Mác-Lenin	Political economics of Marxism and Leninism	Bắt buộc	2	2	0	
III (18 tín chỉ)	PE021IU	Pháp luật Đại cương	General Law	Bắt buộc	3	3	0	
	PE017U	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU,
	BTBC209IU	Hóa sinh 1	Biochemistry 1	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC213IU	Nguyên lý hóa phân tích	Fundamentals of Analytical Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC214IU	Thực hành Nguyên lý hóa phân tích	Fundamental in analytical chemistry lab	Bắt buộc	1	0	1	SH: BTBC213IU
	BTBC217IU	Thiết kế thí nghiệm và kỹ năng báo cáo trong ngành kỹ thuật	Experimental design and technical communication	Bắt buộc	3	3	0	TQ: BT317IU

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BTBC201IU	Hóa hữu cơ 1	Organic Chemistry 1	Bắt buộc	3	3	0	TQ: CH011IU
IV (17 tín chỉ)	BTBC206IU	Hóa hữu cơ 2	Organic Chemistry 2	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC207IU	Thực hành Hóa hữu cơ	Organic Chemistry lab	Bắt buộc	2	0	2	
	BTBC211IU	Hóa sinh 2	Biochemistry 2	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC212IU	Thực hành Hóa sinh 2	Biochemistry 2 lab	Bắt buộc	2	0	2	SH: BTBC211IU
	BTBC313IU	Kỹ thuật Hóa sinh	Methods in Biochemistry	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC314IU	Thực hành Kỹ thuật Hóa sinh	Methods in Biochemistry lab	Bắt buộc	2	0	2	SH: BTBC313IU
	PE018IU	Lịch sử ĐCSVN	History of Vietnamese Communist Party	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU, PE017U
	PE019U	Tư tưởng HCM	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU, PE017U
V (16 tín chỉ)	BT337IU	Tin sinh học	Bioinformatics	Bắt buộc	3	3	0	
	BT338IU	Thực hành tin sinh học	Practice in Bioinformatics	Bắt buộc	1	0	1	SH: BT337IU
	BT405IU	Hóa lý	Physical Chemistry	Bắt buộc	3	3	0	
	BTBC215IU	Phân tích dụng cụ	Instrumental Analysis	Bắt buộc	3	3	0	

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BTBC216IU	Thực hành Phân tích dụng cụ	Instrumental analysis lab	Bắt buộc	1	0	1	SH: BTBC215IU
	PE014IU	Khoa học môi trường	Environmental Science	Bắt buộc	3	3	0	
VI (15 tín chỉ)	BT321IU	Vi sinh	Microbiology	Bắt buộc	3	3	0	
	BT322IU	Thực hành Vi sinh	Practice in Microbiology	Bắt buộc	1	0	1	SH: BT321IU
	BTBC218IU	Sinh học phân tử của tế bào	Molecular Cell Biology	Bắt buộc	3	3	0	
	BTBC219IU	Thực hành Sinh học phân tử của tế bào	Molecular Cell Biology Lab	Bắt buộc	1	0	1	SH: Cell Molecular Biology
	BTBC315IU	Enzyme học	Enzymology	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC316IU	Thực hành Enzyme học	Enzymology lab	Bắt buộc	1	0	1	SH: BTBC315IU
	Kiến thức bổ trợ (tự chọn)		Free Elective courses	Tự chọn	3	3	0	
SUMMER HK VI (2 tín chỉ)	BTBC309IU	Thực tập ngành nghề	Internship	Bắt buộc	2	0	2	TQ: Min 90 credits accumulated
VII (18 tín chỉ)	BTBC304IU	Sinh dược học	Biopharmaceutics	Bắt buộc	3	3	0	TQ: BTBC201IU, BTBC206IU
	BTBC302IU	Hóa lý sinh học	Biophysical Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	Kiến thức chuyên ngành (tự chọn)		Selected Elective courses	Tự chọn	12	9	3	

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
VIII (12 tín chỉ)	BT179IU	Khóa luận tốt nghiệp	Thesis	Bắt buộc	12	0	12	TQ: Min 113 credits accumulated
	Tổng				138	106	32	

10.2 Trình độ IE2

Bảng 7. 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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
I (18 tín chỉ)	ENTP02	Anh văn IE2	IE2	Bắt buộc	13	13	0	
	PE015IU	Triết học Mac-Lenin	Philosophy of Marxism and Leninism	Bắt buộc	3	3	0	
	PE016IU	Kinh tế chính trị Mác-Lenin	Political economics of Marxism and Leninism	Bắt buộc	2	2	0	
	PT001IU	Thể dục 1	Physical Training 1	Bắt buộc	3	3	0	
II	PE014IU	Khoa học môi trường	Environmental Science	Bắt buộc	3	3	0	

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
(19 tín chỉ)	EN011IU, EN012IU	Anh văn chuyên ngành 2	Academic English 2	Bắt buộc	4	4	0	
	PE017U	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU
	BT362IU	Hóa đại cương	Chemistry for Engineers	Bắt buộc	3	3	0	
	BT311IU	Sinh học đại cương	Biology	Bắt buộc	3	3	0	
	BT312IU	Thực hành sinh học đại cương	Practice in biology	Bắt buộc	1	0	1	SH: BT311IU
	PE021IU	Pháp luật Đại cương	General Law	Bắt buộc	3	3	0	
	PT002IU	Thể dục 2	Physical Training 2	Bắt buộc	3	3	0	
SUMMER HK II (10 tín chỉ)	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	MA001IU	Toán cao cấp 1	Calculus 1	Bắt buộc	4	4	0	
	EN011IU, EN012IU	Anh văn chuyên ngành 2	Academic English 2	Bắt buộc	4	4	0	
III (18 tín chỉ)	PE018IU	Lịch sử ĐCSVN	History of Vietnamese Communist Party	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU, PE017U
	PE019U	Tư tưởng HCM	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU, PE017U
	BT317IU	Thống kê sinh học	Biostatistics	Bắt buộc	2	2	0	

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BT318IU	Thực hành thống kê sinh học	Practice in Biostatistics	Bắt buộc	1	0	1	SH: BT317IU
	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
	BTBC103IU	Hóa Vô Cơ	Inorganic Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC104IU	Thực hành Hóa vô cơ	Inorganic Chemistry lab	Bắt buộc	1	0	1	SH: BTBC103IU
	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	TQ: PH013IU
	BTBC102IU	Nhập môn chuyên ngành Hóa sinh	Introduction to Biochemistry	Bắt buộc	2	2	0	
IV (20 tín chỉ)	BTBC213IU	Nguyên lý hóa phân tích	Fundamentals of analytical Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC214IU	Thực hành Nguyên lý hóa phân tích	Fundamental in analytical chemistry lab	Bắt buộc	1	0	1	SH: BTBC213IU
	BTBC313IU	Kỹ thuật Hóa sinh	Methods in Biochemistry	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC314IU	Thực hành Kỹ thuật Hóa sinh	Methods in Biochemistry lab	Bắt buộc	2	0	2	SH: BTBC313IU
	BTBC201IU	Hóa hữu cơ 1	Organic Chemistry 1	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC207IU	Thực hành Hóa hữu cơ	Organic Chemistry lab	Bắt buộc	2	0	2	

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BTBC209IU	Hóa sinh 1	Biochemistry 1	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC217IU	Thiết kế thí nghiệm và kỹ năng báo cáo trong ngành kỹ thuật	Experimental design and technical communication	Bắt buộc	3	3	0	TQ: BT317IU
V (19 tín chỉ)	BTBC211IU	Hóa sinh 2	Biochemistry 2	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC212IU	Thực hành Hóa sinh 2	Biochemistry 2 lab	Bắt buộc	2	0	2	SH: BTBC211IU
	BT337IU	Tin sinh học	Bioinformatics	Bắt buộc	3	3	0	
	BT338IU	Thực hành tin sinh học	Practice in Bioinformatics	Bắt buộc	1	0	1	SH: BT337IU
	BTBC215IU	Phân tích dụng cụ	Instrumental Analysis	Bắt buộc	3	3	0	
	BTBC216IU	Thực hành Phân tích dụng cụ	Instrumental analysis lab	Bắt buộc	1	0	1	SH: BTBC215IU
	BTBC206IU	Hóa hữu cơ 2	Organic Chemistry 2	Bắt buộc	3	3	0	TQ: CH011IU
	BT405IU	Hóa lý	Physical Chemistry	Bắt buộc	3	3	0	
VI (17 tín chỉ)	BT321IU	Vi sinh	Microbiology	Bắt buộc	3	3	0	
	BT322IU	Thực hành Vi sinh	Practice in Microbiology	Bắt buộc	1	0	1	SH: BT321IU
	BTBC302IU	Hóa lý sinh học	Biophysical Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC315IU	Enzyme học	Enzymology	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC316IU	Thực hành Enzyme học	Enzymology lab	Bắt buộc	1	0	1	SH: BTBC315IU

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BTBC304IU	Sinh dược học	Biopharmaceutics	Bắt buộc	3	3	0	TQ: BTBC201IU, BTBC206IU
	Kiến thức bổ trợ (tự chọn)		Free Elective courses	Tự chọn	3	3	0	
	BTBC309IU	Thực tập ngành nghề	Internship	Bắt buộc	2	0	2	TQ: Min 90 credits accumulated
VII (16 tín chỉ)	BTBC218IU	Sinh học phân tử của tế bào	Molecular Cell Biology	Bắt buộc	3	3	0	
	BTBC219IU	Thực hành Sinh học phân tử của tế bào	Molecular Cell Biology Lab	Bắt buộc	1	0	1	SH: Cell Molecular Biology
	Kiến thức chuyên ngành (tự chọn)		Selected Elective courses	Tự chọn	12	9	3	
VIII (12 tín chỉ)	BT179IU	Khóa luận tốt nghiệp	Thesis	Bắt buộc	12	0	12	TQ: Min 113 credits accumulated
		Tổng			151	119	32	

10.3 Trình độ IE1

Bảng 8. 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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
I (30 tín chỉ)	ENTP01	Anh văn IE1	IE1	Bắt buộc	17	17	0	
	ENTP02	Anh văn IE2	IE2	Bắt buộc	13	13	0	
II (17 tín chỉ)	MA001IU	Toán cao cấp 1	Calculus 1	Bắt buộc	4	4	0	
	BT311IU	Sinh học đại cương	Biology	Bắt buộc	3	3	0	
	BT312IU	Thực hành sinh học đại cương	Practice in Biology	Bắt buộc	1	0	1	
	BT362IU	Hóa đại cương	Chemistry for Engineers	Bắt buộc	3	3	0	
	EN007IU, EN008IU	Anh văn chuyên ngành 1	AE 1	Bắt buộc	4	4	0	
	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	PT001IU	Thể dục 1	Physical Training 1	Bắt buộc	3	0	3	
SUMMER HKII (5 tín chỉ)	PE015IU	Triết học Mac-Lenin	Philosophy of Marxism and Leninism	Bắt buộc	3	3	0	
	PE016IU	Kinh tế chính trị Mác-Lenin	Political economics of Marxism and Leninism	Bắt buộc	2	2	0	
III (18 tín chỉ)	EN011IU, EN012IU	Anh văn chuyên ngành 2	AE 2	Bắt buộc	4	4	0	
	BT317IU	Thống kê sinh học	Biostatistics	Bắt buộc	2	2	0	
	BT318IU	Thực hành thống kê sinh học	Practice in Biostatistics	Bắt buộc	1	0	1	SH: BT317IU
	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
	BTBC103IU	Hóa Vô Cơ	Inorganic Chemistry	Bắt buộc	3	3	0	TQ: CH011IU

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BTBC104IU	Thực hành Hóa vô cơ	Inorganic Chemistry lab	Bắt buộc	1	0	1	SH: BTBC103IU
	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	
	BTBC102IU	Nhập môn chuyên ngành Hóa sinh	Introduction to Biochemistry	Bắt buộc	2	2	0	
	PT002IU	Thể dục 2	Physical Training 2	Bắt buộc	3	0	3	
	PE021IU	Pháp luật Đại cương	General Law	Bắt buộc	3	3	0	
IV (18 tín chỉ)	PE017U	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU,
	BTBC209IU	Hóa sinh 1	Biochemistry 1	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC213IU	Nguyên lý hóa phân tích	Fundamentals of Analytical Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC214IU	Thực hành Nguyên lý hóa phân tích	Fundamental in analytical chemistry lab	Bắt buộc	1	0	1	SH: BTBC213IU
	BTBC217IU	Thiết kế thí nghiệm và kỹ năng báo cáo trong ngành kỹ thuật	Experimental design and technical communication	Bắt buộc	3	3	0	TQ: BT317IU
	BTBC201IU	Hóa hữu cơ 1	Organic Chemistry 1	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC206IU	Hóa hữu cơ 2	Organic Chemistry 2	Bắt buộc	3	3	0	TQ: CH011IU
V	BTBC206IU	Hóa hữu cơ 2	Organic Chemistry 2	Bắt buộc	3	3	0	TQ: CH011IU

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
(17 tín chỉ)	BTBC207IU	Thực hành Hóa hữu cơ	Organic Chemistry lab	Bắt buộc	2	0	2	
	BTBC211IU	Hóa sinh 2	Biochemistry 2	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC212IU	Thực hành Hóa sinh 2	Biochemistry 2 lab	Bắt buộc	2	0	2	SH: BTBC211IU
	BTBC313IU	Kỹ thuật Hóa sinh	Methods in Biochemistry	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC314IU	Thực hành Kỹ thuật Hóa sinh	Methods in Biochemistry lab	Bắt buộc	2	0	2	SH: BTBC313IU
	PE018IU	Lịch sử ĐCSVN	History of Vietnamese Communist Party	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU, PE017U
VI (16 tín chỉ)	PE019U	Tư tưởng HCM	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU, PE017U
	BT337IU	Tin sinh học	Bioinformatics	Bắt buộc	3	3	0	
	BT338IU	Thực hành tin sinh học	Practice in Bioinformatics	Bắt buộc	1	0	1	SH: BT337IU
	BT405IU	Hóa lý	Physical Chemistry	Bắt buộc	3	3	0	
	BTBC215IU	Phân tích dụng cụ	Instrumental Analysis	Bắt buộc	3	3	0	
	BTBC216IU	Thực hành Phân tích dụng cụ	Instrumental analysis lab	Bắt buộc	1	0	1	SH: BTBC215IU

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	PE014IU	Khoa học môi trường	Environmental Science	Bắt buộc	3	3	0	
VII (15 tín chỉ)	BT321IU	Vi sinh	Microbiology	Bắt buộc	3	3	0	
	BT322IU	Thực hành Vi sinh	Practice in Microbiology	Bắt buộc	1	0	1	SH: BT321IU
	BTBC218IU	Sinh học phân tử của tế bào	Molecular Cell Biology	Bắt buộc	3	3	0	
	BTBC219IU	Thực hành Sinh học phân tử của tế bào	Molecular Cell Biology Lab	Bắt buộc	1	0	1	SH: Cell Molecular Biology
	BTBC315IU	Enzyme học	Enzymology	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC316IU	Thực hành Enzyme học	Enzymology lab	Bắt buộc	1	0	1	SH: BTBC315IU
	Kiến thức bổ trợ (tự chọn)		Free Elective courses	Tự chọn	3	3	0	
VIII (18 tín chỉ)	BTBC304IU	Sinh dược học	Biopharmaceutics	Bắt buộc	3	3	0	TQ: BTBC201IU, BTBC206IU
	BTBC302IU	Hóa lý sinh học	Biophysical Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	Kiến thức chuyên ngành (tự chọn)		Selected Elective courses	Tự chọn	12	9	3	
SUMMER HK VIII (2 tín chỉ)	BTBC309IU	Thực tập ngành nghề	Internship	Bắt buộc	2	0	2	TQ: Min 90 credits accumulated

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
IX (12 tín chỉ)	BT179IU	Khóa luận tốt nghiệp	Thesis	Bắt buộc	12	0	12	TQ: Min 113 credits accumulated
	Tổng				168	136	32	

10.4. Trình độ IE0

Bảng 9. 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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
I (34 tín chỉ)	ENTP00	Anh văn IE0	IE0	Bắt buộc	17	17	0	
	ENTP01	Annh văn IE1	IE1	Bắt buộc	17	17	0	
II (18 tín chỉ)	ENTP02	Anh văn IE2	IE2	Bắt buộc	13	13	00	
	PE015IU	Triết học Mac-Lenin	Philosophy of Marxism and Leninism	Bắt buộc	3	3	0	
	PE016IU	Kinh tế chính trị Mác-Lenin	Political economics of Marxism and Leninism	Bắt buộc	2	2	0	
	PT001IU	Thể dục 1	Physical Training 1	Bắt buộc	3	3	0	
SUMMER	MA001IU	Toán cao cấp 1	Calculus 1	Bắt buộc	4	4	0	

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
HK II (10 tín chỉ)	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	EN007IU, EN008IU	Anh văn chuyên ngành 1	Academic English 1	Bắt buộc	4	4	0	
III (19 tín chỉ)	PE014IU	Khoa học môi trường	Environmental Science	Bắt buộc	3	3	0	
	EN011IU, EN012IU	Anh văn chuyên ngành 2	Academic English 2	Bắt buộc	4	4	0	
	PE017U	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU
	BT362IU	Hóa đại cương	Chemistry for Engineers	Bắt buộc	3	3	0	
	BT311IU	Sinh học đại cương	Biology	Bắt buộc	3	3	0	
	BT312IU	Thực hành sinh học đại cương	Practice in biology	Bắt buộc	1	0	1	SH: BT311IU
	PE021IU	Pháp luật Đại cương	General Law	Bắt buộc	3	3	0	
	PT002IU	Thể dục 2	Physical Training 2	Bắt buộc	3	3	0	
IV (18 tín chỉ)	PE018IU	Lịch sử ĐCSVN	History of Vietnamese Communist Party	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU, PE017U
	PE019U	Tư tưởng HCM	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0	TQ: PE015IU, PE016IU, PE017U

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BT317IU	Thống kê sinh học	Biostatistics	Bắt buộc	2	2	0	
	BT318IU	Thực hành thống kê sinh học	Practice in Biostatistics	Bắt buộc	1	0	1	SH: BT317IU
	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
	BTBC103IU	Hóa Vô Cơ	Inorganic Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC104IU	Thực hành Hóa vô cơ	Inorganic Chemistry lab	Bắt buộc	1	0	1	SH: BTBC103IU
	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	
	BTBC102IU	Nhập môn chuyên ngành Hóa sinh	Introduction to Biochemistry	Bắt buộc	2	2	0	
V (20 tín chỉ)	BTBC213IU	Nguyên lý hóa phân tích	Fundamentals of Analytical Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC214IU	Thực hành Nguyên lý hóa phân tích	Fundamental in analytical chemistry lab	Bắt buộc	1	0	1	SH: BTBC214IU
	BTBC201IU	Hóa hữu cơ 1	Organic Chemistry 1	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC207IU	Thực hành Hóa hữu cơ	Organic Chemistry lab	Bắt buộc	2	0	2	
	BTBC209IU	Hóa sinh 1	Biochemistry 1	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC313IU	Kỹ thuật Hóa sinh	Methods in Biochemistry	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC314IU	Thực hành Kỹ thuật Hóa sinh	Methods in Biochemistry lab	Bắt buộc	2	0	2	SH: BTBC313IU

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BTBC217IU	Thiết kế thí nghiệm và kỹ năng báo cáo trong ngành kỹ thuật	Experimental design and technical communication	Bắt buộc	3	3	0	TQ: BT317IU
VI (19 tín chỉ)	BTBC211IU	Hóa sinh 2	Biochemistry 2	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC212IU	Thực hành Hóa sinh 2	Biochemistry 2 lab	Bắt buộc	2	0	2	SH: BTBC211IU
	BT337IU	Tin sinh học	Bioinformatics	Bắt buộc	3	3	0	
	BT338IU	Thực hành tin sinh học	Practice in Bioinformatics	Bắt buộc	1	0	1	SH: BT337IU
	BTBC215IU	Phân tích dụng cụ	Instrumental Analysis	Bắt buộc	3	3	0	
	BTBC216IU	Thực hành Phân tích dụng cụ	Instrumental analysis lab	Bắt buộc	1	0	1	SH: BTBC215IU
	BTBC206IU	Hóa hữu cơ 2	Organic Chemistry 2	Bắt buộc	3	3	0	TQ: CH011IU
	BT405IU	Hóa lý	Physical Chemistry	Bắt buộc	3	3	0	
VII (17 tín chỉ)	BT321IU	Vi sinh	Microbiology	Bắt buộc	3	3	0	
	BT322IU	Thực hành Vi sinh	Practice in Microbiology	Bắt buộc	1	0	1	SH: BT321IU
	BTBC302IU	Hóa lý sinh học	Biophysical Chemistry	Bắt buộc	3	3	0	TQ: CH011IU
	BTBC315IU	Enzyme học	Enzymology	Bắt buộc	3	3	0	TQ: BT311IU
	BTBC316IU	Thực hành Enzyme học	Enzymology lab	Bắt buộc	1	0	1	SH: BTBC315IU

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 việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
	BTBC304IU	Sinh dược học	Biopharmaceutics	Bắt buộc	3	3	0	TQ: BTBC201IU, BTBC206IU
	Kiến thức bổ trợ (tự chọn)		Free Elective courses	Tự chọn	3	3	0	
VIII (17 tín chỉ)	BTBC218IU	Sinh học phân tử của tế bào	Molecular Cell Biology	Bắt buộc	3	3	0	
	BTBC219IU	Thực hành Sinh học phân tử của tế bào	Molecular Cell Biology Lab	Bắt buộc	1	0	1	SH: Cell Molecular Biology
	Kiến thức chuyên ngành (tự chọn)		Selected Elective courses	Tự chọn	12	9	3	
SUMMER HK VIII (2 tín chỉ)	BTBC309IU	Thực tập ngành nghề	Internship	Bắt buộc	2	0	2	TQ: Min 90 credits accumulated
IX (12 tín chỉ)	BT179IU	Khóa luận tốt nghiệp	Thesis	Bắt buộc	12	0	12	TQ: Min 113 credits accumulated
	Tổng				185	153	32	

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 chương trình đào tạo ngành Hóa học (chương trình Hóa sinh) được trình bày như Bảng 10.

Bảng 10. Đóng góp của các môn học vào CĐR của CTĐT

STT	Mã môn học	Tên môn học ⁽⁴⁾	Chuẩn đầu ra của CTĐT ⁽⁵⁾							
			PLO1 Level L-H	PLO2 Level L-H	PLO3 Level L-H	PLO4 Level L-H	PLO5 Level L-H	PLO6 Level L-H	PLO7 Level L-H	PLO8 Level L-H
1	MA001IU	Toán cao cấp 1	L	M		M				
2	BT311IU	Sinh học đại cương	L	L	M		M			
3	BT312IU	Thực hành sinh học đại cương	L	L			L			
4	CH011IU	Hóa đại cương	L		L		M		M	
5	EN007IU, EN008IU	Anh văn chuyên ngành 1	M	M			M			M
6	PH013IU	Vật lý 1	L	M						L
7	EN011IU, EN012IU	Anh văn chuyên ngành 2	M	L			M			
8	BT317IU	Thống kê sinh học	H					M	M	

STT	Mã môn học	Tên môn học ⁽⁴⁾	Chuẩn đầu ra của CTĐT ⁽⁵⁾							
			PLO1 Level L-H	PLO2 Level L-H	PLO3 Level L-H	PLO4 Level L-H	PLO5 Level L-H	PLO6 Level L-H	PLO7 Level L-H	PLO8 Level L-H
9	BT318IU	Thực hành thống kê sinh học		H		M	M		L	
10	PE008IU	Tư duy phân tích	L	H						M
11	BTBC103IU	Hóa vô cơ	L		M					M
12	BTBC104IU	Thực hành Hóa vô cơ			L	M	L			
13	PH014IU	Vật lý 2	L	M						L
14	BTBC102IU	Nhập môn chuyên ngành Hóa sinh	M		M		M			
15	PE015IU	Triết học Mac-Lenin	M	M					M	L
16	PE016IU	Kinh tế chính trị Mác-Lenin	M				L		M	L

STT	Mã môn học	Tên môn học ⁽⁴⁾	Chuẩn đầu ra của CTĐT ⁽⁵⁾							
			PLO1 Level L-H	PLO2 Level L-H	PLO3 Level L-H	PLO4 Level L-H	PLO5 Level L-H	PLO6 Level L-H	PLO7 Level L-H	PLO8 Level L-H
17	PE021IU	Pháp luật Đại cương		H			M			
18	PE017U	Chủ nghĩa xã hội khoa học	M				L		M	L
19	BTBC209IU	Hóa sinh 1		H	M					
20	BTBC218IU	Sinh học phân tử của tế bào		H	L					H
21	BTBC219IU	Thực hành Sinh học phân tử của tế bào		H	L	H				
22	BTBC217IU	Thiết kế thí nghiệm và kỹ năng báo cáo trong ngành kỹ thuật	M	M					M	M

STT	Mã môn học	Tên môn học ⁽⁴⁾	Chuẩn đầu ra của CTĐT ⁽⁵⁾							
			PLO1 Level L-H	PLO2 Level L-H	PLO3 Level L-H	PLO4 Level L-H	PLO5 Level L-H	PLO6 Level L-H	PLO7 Level L-H	PLO8 Level L-H
23	BTBC201IU	Hóa hữu cơ 1		H	M					
24	BTBC206IU	Hóa hữu cơ 2		H	M					
25	BTBC207IU	Thực hành Hóa hữu cơ		M	M	M	M			
26	BTBC211IU	Hóa sinh 2		H	L					H
27	BTBC212IU	Thực hành Hóa sinh 2		M	L	H				
28	BTBC213IU	Nguyên lý hóa phân tích	L	M		M	H			
29	BTBC214IU	Thực hành Nguyên lý hóa phân tích		M	M		M			
30	PE018IU	Lịch sử ĐCSVN	M							M

STT	Mã môn học	Tên môn học ⁽⁴⁾	Chuẩn đầu ra của CTĐT ⁽⁵⁾							
			PLO1 Level L-H	PLO2 Level L-H	PLO3 Level L-H	PLO4 Level L-H	PLO5 Level L-H	PLO6 Level L-H	PLO7 Level L-H	PLO8 Level L-H
31	PE019U	Tư tưởng HCM	M	M						H
32	BT337IU	Tin sinh học	L	M	M	L	H	M		H
33	BT338IU	Thực hành tin sinh học	L	M		M			H	
34	BTBC302IU	Hóa lý sinh học	H		M			H	M	
35	BTBC215IU	Phân tích dụng cụ		M	M		M			
36	BTBC216IU	Thực hành Phân tích dụng cụ		M		M	M			
37	PE014IU	Khoa học môi trường	M				L			
38	BT321IU	Vi sinh	L	M			M			M
39	BT322IU	Thực hành Vi sinh	M			M				

STT	Mã môn học	Tên môn học ⁽⁴⁾	Chuẩn đầu ra của CTĐT ⁽⁵⁾							
			PLO1 Level L-H	PLO2 Level L-H	PLO3 Level L-H	PLO4 Level L-H	PLO5 Level L-H	PLO6 Level L-H	PLO7 Level L-H	PLO8 Level L-H
48	BTBC317IU	Hóa sinh dinh dưỡng		H	M					M
49	BTBC318U	Thực hành Hóa sinh dinh dưỡng			M	H	M			
50	BTBC417IU	Liệu pháp dinh dưỡng		H	L					M
51	BTBC418IU	Thực hành liệu pháp dinh dưỡng			M	M	M			
52	BTBC419IU	Dinh dưỡng lâm sàng		H	L					M
53	BTBC420IU	Thực hành dinh dưỡng lâm sàng			M	M	M			
54	BTBC408IU	Phát triển thuốc		H						M

STT	Mã môn học	Tên môn học ⁽⁴⁾	Chuẩn đầu ra của CTĐT ⁽⁵⁾							
			PLO1 Level L-H	PLO2 Level L-H	PLO3 Level L-H	PLO4 Level L-H	PLO5 Level L-H	PLO6 Level L-H	PLO7 Level L-H	PLO8 Level L-H
55	BTBC423IU	Thực hành phát triển thuốc	L	H	H	H	M	H		
56	BTBC409IU	Mỹ phẩm & mỹ dược 1		H	L					M
57	BTBC410IU	Mỹ phẩm & mỹ dược 2		H	L					M
58	BTBC411IU	Thực hành mỹ phẩm & mỹ dược		M		M				L
59	BTBC421IU	Dưỡng dược		H	M					
60	BTBC422IU	Thực hành dưỡng dược		M		M		M		
61	BT335IU	Miễn dịch học	L		M		M			M
62	BT336IU	Thực hành			L	H	L	M		

STT	Mã môn học	Tên môn học ⁽⁴⁾	Chuẩn đầu ra của CTĐT ⁽⁵⁾							
			PLO1 Level L-H	PLO2 Level L-H	PLO3 Level L-H	PLO4 Level L-H	PLO5 Level L-H	PLO6 Level L-H	PLO7 Level L-H	PLO8 Level L-H
		miễn dịch học								
63	BTBC415IU	Công nghệ lên men		H	L					M
64	BTBC416IU	Thực hành công nghệ lên men		M		M		M		
65	BTBC413IU	Hóa sinh lâm sàng		H	M					
66	BTBC414IU	Thực hành Hóa sinh lâm sàng			M	H	M			
67	BT210IU	Sinh lý người		L	L		M		H	
68	BTBC424IU	Hóa bề mặt	M		M			H	M	
69	BT351IU	Chuẩn đoán phân tử	L	M			M			
	Kiến thức bổ trợ (tự chọn tối thiểu 3 tín chỉ)									

STT	Mã môn học	Tên môn học ⁽⁴⁾	Chuẩn đầu ra của CTĐT ⁽⁵⁾							
			PLO1 Level L-H	PLO2 Level L-H	PLO3 Level L-H	PLO4 Level L-H	PLO5 Level L-H	PLO6 Level L-H	PLO7 Level L-H	PLO8 Level L-H
70	IS050IU	Quản lý dự án	M	M			M			M
71	BA164IU	Quản lý sản xuất	H	M						H
72	IS078IU	Kỹ thuật Thiết kế Chuỗi cung ứng và Logistics	H	M						H

Trong đó: L: Low (có đóng góp thấp)

M: Medium (có đóng góp trung bình)

H: High (có đóng góp cao)

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

12.1. Tên môn học (tiếng Anh, tiếng Việt): Philosophy of Marxism and Leninism, Triết học Mac-Lenin

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: N/A

- Mô tả nội dung môn học: The course equips students with basic knowledge of Marxist-Leninist philosophy.

12.2. Tên môn học (tiếng Anh, tiếng Việt): Political economics of Marxism and Leninism, Kinh tế chính trị Mác-Lenin

- Số tín chỉ: 2 (3.08 ECTS)

- Điều kiện tiên quyết/Môn học trước: N/A

- Mô tả nội dung môn học: The program consists of 6 chapters, in which Chapter 1 discusses the Objects, research methods and functions of Marxist-Leninist political economy; the remaining chapters present the core content of Marxist-Leninist Political

Economy according to the module's objectives. Specifically, the content includes commodities, markets and the role of stakeholders; producing surplus value; competition and monopoly; socialist-oriented market economy and economic interest relations in Vietnam; and industrialization, modernization, and international economic integration in Vietnam.

12.3. Tên môn học (tiếng Anh, tiếng Việt): Scientific socialism, Chủ nghĩa xã hội khoa học

- Số tín chỉ: 2 (3.08 ECTS)
- Điều kiện tiên quyết/Môn học trước: Philosophy of Marxism and Leninism, Political economics of Marxism and Leninism, Scientific socialism
- Mô tả nội dung môn học: The course equips students with basic knowledge of scientific socialism.

12.4. Tên môn học (tiếng Anh, tiếng Việt): History of Vietnamese Communist Party, Lịch sử ĐCSVN

- Số tín chỉ: 2 (3.08 ECTS)
- Điều kiện tiên quyết/Môn học trước: Philosophy of Marxism and Leninism, Political economics of Marxism and Leninism, Scientific socialism
- Mô tả nội dung môn học: The course equips students with basic knowledge about the History of the Communist Party of Vietnam

12.5. Tên môn học (tiếng Anh, tiếng Việt): Ho Chi Minh's Thoughts, Tư tưởng HCM

- Số tín chỉ: 2 (3.08 ECTS)
- Điều kiện tiên quyết/Môn học trước: Philosophy of Marxism and Leninism, Political economics of Marxism and Leninism, Scientific socialism
- Mô tả nội dung môn học: The course equips students with basic knowledge about subjects, research methods and meaning of Ho Chi Minh's ideologies; origin of Ho Chi Minh's ideologies; national independence and socialism; Communist Party of VietNam and the Vietnamese State; great national unity and international solidarity; culture, morality and human.

12.6. Tên môn học (tiếng Anh, tiếng Việt): General Law, Pháp Luật Đại cương

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: 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.

12.7. Tên môn học (tiếng Anh, tiếng Việt): Critical Thinking, Tư duy phân tích

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: N/A –

- Mô tả nội dung môn học: This course provides the nature and techniques of thought as a basis for our claims, beliefs, and attitudes about the world. The course also explores the process in which people develop their claims and support their beliefs.

Specifically, the course includes the theory and practice of presenting arguments in oral and written forms, making deductive and inductive arguments, evaluating the validity or strength of arguments, detecting fallacies in arguments, and refuting fallacious arguments.

Resources for the reasoning process include hypothetical and real-life situations in various fields of natural sciences, social sciences, and humanities.

12.8. Tên môn học (tiếng Anh, tiếng Việt): Academic English 1, Anh văn chuyên ngành 1

- Số tín chỉ: 4 (6.16 ECTS)

- Điều kiện tiên quyết/Môn học trước:

- + Hold TOEFL IBT certificate with score ≥ 61

- + Hold IELTS certificate with score ≥ 5.5

- + Have completed IE2 course.

- Mô tả nội dung môn học:

- + Writing AE1: 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.

- + Listening AE1: 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.

12.9. Tên môn học (tiếng Anh, tiếng Việt): Academic English 2, Anh văn chuyên ngành 2

- Số tín chỉ: 4 (6.16 ECTS)

- Điều kiện tiên quyết/Môn học trước: AE1 course

- Mô tả nội dung môn học:

- + Writing AE2: 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.

+ Speaking AE2: 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).

12.10. Tên môn học (tiếng Anh, tiếng Việt): Calculus 1, Toán cao cấp 1

- Số tín chỉ: 4 (6.16 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course equip students with basic concepts of calculus: limits, continuity, differentiation, and integration. Applications of these concepts are extensively discussed.

12.11. Tên môn học (tiếng Anh, tiếng Việt): Physics 1, Vật lý 1

- Số tín chỉ: 2 (3.08 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This subject will provide an introduction to mechanics including: concepts and principles of kinetics, dynamics, energetics of motion of a particle and a rigid body

12.12. Tên môn học (tiếng Anh, tiếng Việt): Physics 2, Vật lý 2

- Số tín chỉ: 2 (3.08 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This subject will provide a basic knowledge of fluid mechanics; macroscopic description of gases; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gases and the kinetic theory of gases.

12.13. Tên môn học (tiếng Anh, tiếng Việt): Chemistry for Engineers, Hóa đại cương

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This one-semester course is designed for students who are pursuing an engineering degree (e.g., information technology, biotechnology, civil, biomedical, electronic, and telecommunication engineering) and chemistry-related ones (e.g., applied chemistry and chemical engineering). The course will introduce the basic principles of chemistry and connect those principles to issues in the engineering profession.

12.14. Tên môn học (tiếng Anh, tiếng Việt): Biology, Sinh học đại cương

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: The key concepts in the course are organized into units on biochemistry, molecular biology, cell biology, genetics, evolution, and ecology. Basic principles and theories of biology addressed in the course include: the chemical basis of life; cell theory; energy flow and management; gene and gene products (including

inheritance and gene expression); evolution, especially by means of natural selection; and studies of ecological populations and their interactions with living and non-living aspects of their environment.

12.15. Tên môn học (tiếng Anh, tiếng Việt): Practice in biology, Thực hành sinh học đại cương

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: Enrol Biology course.
- Mô tả nội dung môn học: This course demonstrates the basic practice works with biological samples and reactions. Students will be introduced with sample preparation, observation, and analysis.

12.16. Tên môn học (tiếng Anh, tiếng Việt): Inorganic Chemistry, Hóa Vô cơ

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Chemistry for Engineers
- Mô tả nội dung môn học: This course is specifically designed for students of Biochemistry. This course focuses on the fundamentals of inorganic chemistry and its relevance to biochemistry. The course's content includes studies of trends in reactivity, structures and properties of the elements and their compounds, and biological inorganic chemistry.

12.17. Tên môn học (tiếng Anh, tiếng Việt): Inorganic Chemistry lab, Thực hành Hóa vô cơ

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: The inorganic chemistry laboratory course introduces the student to fundamental techniques and procedures in preparing solutions, limit test, synthesis and characterization of inorganic compounds and simple reactions used in the inorganic chemistry laboratory. In addition, the student will be trained in the proper way to write a scientific laboratory report.

12.18. Tên môn học (tiếng Anh, tiếng Việt): Organic Chemistry 1, Hóa hữu cơ 1

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Chemistry for Engineers
- Mô tả nội dung môn học: This course is specifically designed for students of Biochemistry. It is the first part of a 2-semester course in Organic Chemistry. This particular module provides fundamental information on aspects of stereochemistry and the basics of addition, substitution and elimination reactions, functional groups, saturated and aromatic heterocyclic compounds.

12.19. Tên môn học (tiếng Anh, tiếng Việt): Organic Chemistry 2, Hóa hữu cơ 2

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: Chemistry for Engineers
- Mô tả nội dung môn học: This course is specifically designed for students of Biochemistry. It is the second part of a 2- semester course in Organic Chemistry. This particular module provides fundamental information on functional groups, mechanisms of their common reactions with a biological emphasis.

12.20. Tên môn học (tiếng Anh, tiếng Việt): Organic Chemistry lab, Thực hành Hóa hữu cơ

- Số tín chỉ: 2 (4 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: The organic chemistry laboratory course introduces the student to fundamental techniques and procedures in extraction, purification, synthesis and characterization of organic compounds and simple reactions used in the organic chemistry laboratory. In addition, the student will be trained in the proper way to write a scientific laboratory report.

12.21. Tên môn học (tiếng Anh, tiếng Việt): Fundamentals of Analytical Chemistry, Nguyên lý hóa phân tích

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Chemistry for Engineers
- Mô tả nội dung môn học: This course is designed to provide the fundamentals of analytical chemistry along with practical principles for working in laboratories, as a requirement for students of biochemistry

12.22. Tên môn học (tiếng Anh, tiếng Việt): Fundamental in analytical chemistry lab, Thực hành Nguyên lý hóa phân tích

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course is designed to provide the practical skills in making chemical analysis and applied theory learned in the course “Fundamental of analytical chemistry”

12.23. Tên môn học (tiếng Anh, tiếng Việt): Instrumental Analysis, Phân tích dụng cụ

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course is designed to provide the fundamentals of instrumental analysis along with practical principles for working in laboratories, as a requirement for students of biochemistry.

12.24. Tên môn học (tiếng Anh, tiếng Việt): Instrumental analysis lab, Thực hành Phân tích dụng cụ

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A

- Mô tả nội dung môn học: This course is designed to provide the practical skills in making chemical analysis and applied theory learned in the course “Instrumental analysis”

12.25. Tên môn học (tiếng Anh, tiếng Việt): Environmental Science, Khoa học môi trường

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course provides the basic knowledge about environmental science; population growth and utilization of natural resources and the environment; natural resources and current exploitation; pollution and its impacts, environmental economic and sustainable development. It also aims to raise students’ awareness about possible impacts of human activities on the environment and natural resources in order to apply relevant economic practices.

12.26. Tên môn học (tiếng Anh, tiếng Việt): Biostatistics, Thống kê sinh học

- Số tín chỉ: 2 (3.08 ECTS)
- Điều kiện tiên quyết/Môn học trước: Calculus I
- Mô tả nội dung môn học: On campus course

12.27. Tên môn học (tiếng Anh, tiếng Việt): Practice in Biostatistics, Thực hành thống kê sinh học

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: Calculus I, Biostatistics
- Mô tả nội dung môn học: The course will introduce students to the scope, nature, tools, language, and interpretation of elementary statistics. It will include descriptive statistics, inferential statistics, types of hypothesis testing methods, usage of statistical computer packages (Data analysis in Excel)

12.28. Tên môn học (tiếng Anh, tiếng Việt): Introduction to Biochemistry, Nhập môn chuyên ngành Hóa sinh

- Số tín chỉ: 2 (3.08 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: Biochemistry is the study of the molecular basis of life. This one-semester course is designed for Biochemistry students who are pursuing a Bachelor degree in Biochemistry.

12.29. Tên môn học (tiếng Anh, tiếng Việt): Experimental design and technical communication, Thiết kế thí nghiệm và kỹ năng báo cáo trong ngành kỹ thuật

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biostatistics
- Mô tả nội dung môn học: This subject will provide knowledge on following:

Introduction to scientific research, hypothesis testing and experimental design in chemical science.

Structure of a research paper and how to complete a research writing.

Course projects that are used to evaluate how theory is applied in practice as well as to develop interpersonal skills.

12.30. Tên môn học (tiếng Anh, tiếng Việt): Biochemistry 1, Hóa sinh 1

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biology
- Mô tả nội dung môn học: This course is part of two-part general biochemistry designed for students who are pursuing the bachelor's degree in biochemistry. Course covers some central concepts in general biochemistry. Topics include the sources, classification, properties, functions of 4 macromolecules (carbohydrates, lipids, proteins and nucleic acids) and vitamins.

12.31. Tên môn học (tiếng Anh, tiếng Việt): Biochemistry 2, Hóa sinh 2

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biology
- Mô tả nội dung môn học: This course is designed to provide the basic understanding of metabolic pathways with emphasis on the reactions, bioenergetics, regulation and disease relevance.

12.32. Tên môn học (tiếng Anh, tiếng Việt): Biochemistry 2 lab, Thực hành Hóa sinh 2

- Số tín chỉ: 2 (4 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course is designed to build proficiency in laboratory techniques and give hands-on experience of concepts related to Biochemistry course.

12.33. Tên môn học (tiếng Anh, tiếng Việt): Microbiology, Vi sinh

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biology
- Mô tả nội dung môn học: This microbiology course is designed for the biotechnology/ food technology/biochemistry major interested in learning about the microbial world. In this course, students will study the fundamental structural and metabolic characteristics of microorganisms, the interactions between them and their environments, and basic microbial culture techniques. The course also offers introductory information on the applications of microorganisms in a number of different fields.

12.34. Tên môn học (tiếng Anh, tiếng Việt): Practice in Microbiology, Thực hành Vi sinh

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biology, Microbiology

- Mô tả nội dung môn học: This course is designed for undergraduate students to acquire basic knowledge and techniques in microbiology research. Students will be introduced and practice with basic techniques and procedure such as media preparation; aseptic and sub-culturing technique; setup conditions for microbial growth; Gram staining and analysis using microscope, as well as bacterial enumeration. In addition, students will be also engaged partially with process of characterizing an unknown microbial species.

12.35. Tên môn học (tiếng Anh, tiếng Việt): Cell Molecular Biology, Sinh học phân tử của tế bào

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biology
- Mô tả nội dung môn học: This course is designed with emphasis on the structure of cells and its constituents as well as basic molecular cell mechanisms and their regulation. Some molecular genetic techniques are also introduced in the course.

12.36. Tên môn học (tiếng Anh, tiếng Việt): Cell Molecular Biology Lab, Thực hành Sinh học phân tử của tế bào

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course is designed to build proficiency in laboratory techniques and give hands-on experience of concepts related to Biochemistry course.

12.37. Tên môn học (tiếng Anh, tiếng Việt): Bioinformatics, Tin sinh học

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: The basics of bioinformatics are explained, followed by discussions of the state-of-the-art computational tools available to solve biological research problems. All key areas of bioinformatics are covered including biological databases, next-generation sequencing, sequence alignment, gene and promoter prediction, molecular phylogenetics, structural bioinformatics, genomics and proteomics. Some applications of bioinformatics in drug design will be introduced at the end of the course.

12.38. Tên môn học (tiếng Anh, tiếng Việt): Practice in Bioinformatics, Thực hành tin sinh học

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: Bioinformatics
- Mô tả nội dung môn học: The course will introduce students to different environments of bioinformatic tools. Students will gain the knowledge in knowing different version of tools, installing Windows-supported tools, reading the manual to use the tool.

12.39. Tên môn học (tiếng Anh, tiếng Việt): Enzymology, Enzyme học

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: Biology
- Mô tả nội dung môn học: On campus course

12.40. Tên môn học (tiếng Anh, tiếng Việt): Enzymology lab, Thực hành Enzyme học

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course aims to
 - Provide students with knowledge on the structure and function of enzymes, with special reference to molecular mechanisms underlying the catalytic activity, and mechanisms of inhibition and modulation.
 - Provide introduction to some of the basic techniques for the extraction, purification and characterization of the enzymes.
 - Provide discussions on some typical enzymes

12.41. Tên môn học (tiếng Anh, tiếng Việt): Biopharmaceutics, Sinh dược học

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Organic Chemistry 1, Organic Chemistry 2
- Mô tả nội dung môn học: This one-semester course is designed for Biochemistry students who are pursuing a Bachelor degree in Biochemistry towards medicine and pharmacy. The processes of absorption, distribution, metabolism, and excretion of drugs are introduced with the purpose of improving the evaluation of drug delivery systems, and the therapeutic management of patients. Additionally, the relevance to generic substitution of drugs is described. The course covered includes the physicochemical principles of pharmacy, such as acid-base theory, solubility, physical states of drugs, thermodynamics, drug stability, excipients, surfactants, dispersions, polymers, drug delivery, chemical compatibility and interactions of drugs in various dosage forms.

12.42. Tên môn học (tiếng Anh, tiếng Việt): Biophysical Chemistry, Hóa lý sinh học

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Chemistry for Engineers
- Mô tả nội dung môn học: On campus course

12.43. Tên môn học (tiếng Anh, tiếng Việt): Methods in Biochemistry, Kỹ thuật Hóa sinh

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biology
- Mô tả nội dung môn học: This course is designed to provide a basic understanding of the principles, overall work-flow and applications of common techniques in biochemistry.

12.44. Tên môn học (tiếng Anh, tiếng Việt): Methods in Biochemistry lab, Thực hành Kỹ thuật Hóa sinh

- Số tín chỉ: 2 (4 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course aims to provide a basic understanding and the accurate execution of different techniques in biochemistry.

12.45. Tên môn học (tiếng Anh, tiếng Việt): Physical Chemistry, Hóa lý

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: On campus course

12.46. Tên môn học (tiếng Anh, tiếng Việt): Nutritional Biochemistry, Hóa sinh dinh dưỡng

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biochemistry 1, Biochemistry 2
- Mô tả nội dung môn học: This course aims to provide a basic understanding of the metabolism of macro and micronutrients and of the role of nutrition in influencing cell growth, cancer development, blood formation and gene function. Emphasis will be on clinical relevance, the integration of biochemical pathways and how this is modulated by dietary change, and on techniques used to assess both normal dietary requirements and nutrient deficiencies. Students will be introduced to biochemical mechanisms of energy expenditure and storage, including metabolic adaptation to periods of fasting or food intake.

12.47. Tên môn học (tiếng Anh, tiếng Việt): Nutritional Biochemistry Lab, Thực hành Hóa sinh dinh dưỡng

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This subject will provide an introduction to key methods in biochemistry in order to test nutrients.

12.48. Tên môn học (tiếng Anh, tiếng Việt): Nutrition Therapy, Liệu pháp dinh dưỡng

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biochemistry 1, Biochemistry 2
- Mô tả nội dung môn học: This course enables the student to understand the introductory knowledge of diet therapy and planning nutritional care in a clinical setting. This course also enables the student to deal with obesity and diabetes problems.

12.49. Tên môn học (tiếng Anh, tiếng Việt): Nutrition Therapy Lab, Thực hành Liệu pháp dinh dưỡng

- Số tín chỉ: 1 (2 ECTS)

- Điều kiện tiên quyết/Môn học trước: N/A

- Mô tả nội dung môn học: This course helps students learn about: Medical nutrition care process for typical case studies with hypertension, diabetes mellitus, and cardiovascular diseases, nutrition assessment, diagnosis, intervention, monitoring and evaluation for students' nutritional problems

12.50. Tên môn học (tiếng Anh, tiếng Việt): Clinical Nutrition, Dinh dưỡng lâm sàng

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: Biochemistry 1, Biochemistry 22

- Mô tả nội dung môn học: This course presents the principles and practice of scientifically based clinical nutrition. Topics discussed include nutritional assessment (nutritional implications of the physical exam, laboratory studies, and more), macronutrients, micronutrients, phytonutrients, enzymes, and other factors. Various conditions are discussed with emphasis on understanding that they are different expressions of imbalances and/or dysfunction that are preventable and correctable in many cases. Besides, students learn how to set up a plan on nutrition care based on the clinical biochemistry tests and patient diagnostics and monitoring and evaluating the process of nutrition care.

12.51. Tên môn học (tiếng Anh, tiếng Việt): Clinical Nutrition Lab, Thực hành dinh dưỡng lâm sàng

- Số tín chỉ: 1 (2 ECTS)

- Điều kiện tiên quyết/Môn học trước: N/A

- Mô tả nội dung môn học: This course helps students learn about: Nutrition assessment in format from clinical side, anthropometric assessment including weight measurement, height measurement for normal and bedridden patients, waist, hip and mid upper arm circumference measurement, calculate accuracy and precision of the measurement, clinical signs of malnutrition and vitamin deficiency, biochemical results and historical dietary intake assessment

12.52. Tên môn học (tiếng Anh, tiếng Việt): Drug Development, Phát triển thuốc

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: Organic chemistry 2

- Mô tả nội dung môn học: This course will emphasize on the original and developmental process of herbal and synthetic drugs. Application of organic synthesis and modern methods towards the development of pharmaceutical drugs will be covered, followed by discussions of some relevant drug targets. The course will provide the groundwork for learning medicinal chemistry and pharmaceutical technology.

12.53. Tên môn học (tiếng Anh, tiếng Việt): Drug Development Lab, Thực hành phát triển thuốc

- Số tín chỉ: 1 (2 ECTS)

- Điều kiện tiên quyết/Môn học trước: Organic chemistry 2

- Mô tả nội dung môn học: The drug development laboratory course will emphasize on the application of organic synthesis towards the development of pharmaceutical targets. The important organic reactions in drug synthesis are covered, together with several drug syntheses. The course will provide the groundwork for learning medicinal chemistry and pharmaceutical technology. In addition, the student will be trained in the proper way to write a scientific laboratory report.

12.54. Tên môn học (tiếng Anh, tiếng Việt): Comestics and Cosmeceuticals 1, Mỹ phẩm & mỹ dược 1

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: Organic chemistry 2

- Mô tả nội dung môn học: Cosmetics are designed for use on the hair and body, especially the face, to improve its appearance. Cosmeceuticals represent a marriage between cosmetics and pharmaceuticals. This course is designed to impart knowledge and skills necessary for the fundamental need for cosmetic and cosmeceutical products.

12.55. Tên môn học (tiếng Anh, tiếng Việt): Comestics and Cosmeceuticals 2, Mỹ phẩm & mỹ dược 2

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: Comestics and Cosmeceuticals 1

- Mô tả nội dung môn học: Cosmetics are designed for use on the hair and body, especially the face, to improve its appearance. Cosmeceuticals represent a marriage between cosmetics and pharmaceuticals. This course is designed to impart knowledge and skills necessary for the fundamental need for cosmetic and cosmeceutical products.

12.56. Tên môn học (tiếng Anh, tiếng Việt): Comestics and Cosmeceuticals Lab, Thực hành mỹ phẩm & mỹ dược

- Số tín chỉ: 2 (4 ECTS)

- Điều kiện tiên quyết/Môn học trước: Comestics and Cosmeceuticals 1

- Mô tả nội dung môn học: This Fermentation Technology course is designed for the applied chemistry major interested in learning about biological processes and fermented products. The course will equip students with the principles of fermentation technology (e.g. the processes of fermentation, fermentation types and fermentation design), microbial growth kinetics and selection of potential microbes used in industry and principles of major methods for industrial fermentation product recovery and purification.

A part of the course will also introduce a number of products (biofuels, food and pharmaceutical substances) produced by using fermentation technology.

12.57. Tên môn học (tiếng Anh, tiếng Việt): Nutraceuticals, Dưỡng dược

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: Organic chemistry 2
- Mô tả nội dung môn học: This course is intended to introduce the scientific basis for the development of functional foods and nutraceuticals, including their health benefits, development, and regulation.

12.58. Tên môn học (tiếng Anh, tiếng Việt): Nutraceuticals Lab, Thực hành dưỡng dược

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course aims to
 - Provide students with knowledge on the Phytochemical testing, identification of antioxidant activities
 - Provide instructions on some of the basic techniques and applications for different methods in UV spectrometry
 - Understand the analysis of data to reach sound scientific conclusions

12.59. Tên môn học (tiếng Anh, tiếng Việt): Immunology, Miễn dịch học

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biology
- Mô tả nội dung môn học: This subject will provide a general introduction to basic knowledge on immune system and its application: the components and functions of the immune system, mechanisms of innate and adaptive immunity at different levels and to different invading microorganisms such as fungi, bacteria, protozoa, worms and viruses; applications of Immunology in vaccine production, blood transfusion, allergy treatment, autoimmune diseases, cancer, monoclonal antibody, and in tissue or organ transplantation.

12.60. Tên môn học (tiếng Anh, tiếng Việt): Immunology lab, Thực hành miễn dịch học

- Số tín chỉ: 1 (2 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biology, Practice in Biology, Immunology
- Mô tả nội dung môn học: The course will introduce students to various methods used in immunological field. It will equip students with skills on immunological techniques and complement the information gained in lectures. This includes determining types of immune cells, blood types, detecting specificity of antigen and antibody, ELISA.

12.61. Tên môn học (tiếng Anh, tiếng Việt): Fermentation Technology, Công nghệ lên men

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biology, Microbiology
- Mô tả nội dung môn học: This Fermentation Technology course is designed for the applied chemistry major interested in learning about biological processes and fermented products. The course will equip students with the principles of fermentation technology

(e.g. the processes of fermentation, fermentation types and fermentation design), microbial growth kinetics and selection of potential microbes used in industry and principles of major methods for industrial fermentation product recovery and purification. A part of the course will also introduce a number of products (biofuels, food and pharmaceutical substances) produced by using fermentation technology.

12.62. Tên môn học (tiếng Anh, tiếng Việt): Fermentation Technology lab, Thực hành Công nghệ lên men

- Số tín chỉ: 1 (2 ECTS)

- Điều kiện tiên quyết/Môn học trước:

- Mô tả nội dung môn học: This Fermentation Technology course is designed for the applied chemistry major interested in learning about biological processes and fermented products. The course will equip students with the principles of fermentation technology and major methods for industrial fermentation product recovery and purification.

12.63. Tên môn học (tiếng Anh, tiếng Việt): Clinical Biochemistry, Hóa sinh lâm sàng

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: N/A

- Mô tả nội dung môn học: This course aims to provide a basic understanding of the techniques in diagnostics of various diseases. You will be able to analyze the complex structure of biomolecules in the human body such as glucose, bilirubin, creatinine, ALT, AST and etc.

12.64. Tên môn học (tiếng Anh, tiếng Việt): Clinical Biochemistry Lab, Thực hành Hóa sinh lâm sàng

- Số tín chỉ: 1 (2 ECTS)

- Điều kiện tiên quyết/Môn học trước: N/A

- Mô tả nội dung môn học: This course covers various experimental aspects related with clinical biochemistry such as urinary analysis of bioorganic constituents and estimation of proteins, urea, uric acid, minerals, etc., in urine which is essential for early diagnosis of a disease and also assessment of its therapy efficacy.

12.65. Tên môn học (tiếng Anh, tiếng Việt): Human Physiology, Sinh lý người

- Số tín chỉ: 3 (4.62 ECTS)

- Điều kiện tiên quyết/Môn học trước: Introduction to Biochemistry

- Mô tả nội dung môn học: This course is designed to help further student's understanding of the physiology function of human, particularly from cells to body systems. The principal goal is to learn about the function & regulation of the human body and physiological integration of the organ systems to maintain homeostasis. Students examine the mechanisms of body function, organized around the central theme of homeostasis – how the body meets changing demands while maintaining the internal constancy necessary for all cells and organs to function. Course content will include neural

& hormonal homeostatic control mechanisms, as well as study of the cell physiology, plasma membrane and membrane potential, circulatory, respiratory, urinary, immune, reproductive physiology, and endocrine organ systems. The lecture also provides to students the applications of human physiology on advanced research for regenerative biomedicine, cell therapy and assisted reproductive for human.

12.66. Tên môn học (tiếng Anh, tiếng Việt): The chemistry of surfaces and interfaces, Hóa bề mặt

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Physical Chemistry
- Mô tả nội dung môn học: This course covers various experimental aspects related with clinical biochemistry such as urinary analysis of bioorganic constituents and estimation of proteins, urea, uric acid, minerals, etc., in urine which is essential for early diagnosis of a disease and also assessment of its therapy efficacy.

12.67. Tên môn học (tiếng Anh, tiếng Việt): Molecular Diagnostics, Chuẩn đoán phân tử

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: Biochemistry 1, Biochemistry 2, Methods in Biochemistry
- Mô tả nội dung môn học: The molecular diagnostics course is an applied course, using molecular biotechnology using both protein and nucleic-acid-based methods in diagnosis of the infectious diseases in human, plant, animal, and food as well as the identify genetic causative or risks contributing to diseases. The molecular techniques are reviewed and studied to apply them as the diagnosis tools, also the troubleshooting for diverse technical applications. The course gives the approach to develop new or advance methods for diagnosis of the diseases based on the principle of molecular biotechnology. The applications in detection of target infectious disease or genetic or somatic causative/risk variants will be introduced and discussed.

12.68. Tên môn học (tiếng Anh, tiếng Việt): Project Management, Quản lý dự án

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course is developed to provide the principal concept on project management which was characterized by the project management body of knowledge guide (PMBOK Guide). This guide emphasizes the five project process groups of initiating, planning, executing, controlling, and closing, and the nine knowledge areas of project integration, scope, time, cost, quality, human resources, communication, risk, and procurement management.

12.69. Tên môn học (tiếng Anh, tiếng Việt): Production and Operation management, Quản lý sản xuất

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This subject will provide students with sound theoretical and pragmatic approaches that will guide them in the formulation and implementation of corporate, business, and functional strategies.

12.70. Tên môn học (tiếng Anh, tiếng Việt): Logistics Engineering & Supply Chain Design, Kỹ thuật Thiết kế Chuỗi cung ứng và Logistics

- Số tín chỉ: 3 (4.62 ECTS)
- Điều kiện tiên quyết/Môn học trước: N/A
- Mô tả nội dung môn học: This course aims to
 - Develop an understanding of concepts and key points of Supply Chain Management.
 - Develop an understanding of Logistics and Supply Chain structure, and how to design an effective supply chain.
 - Formulate and solve problems related to logistics and supply chain with optimization techniques.

12.71. Tên môn học (tiếng Anh, tiếng Việt): Internship, Thực tập ngành nghề

- Số tín chỉ: 2 (5.82 ECTS)
- Điều kiện tiên quyết/Môn học trước: Accumulated at least 90 Credits
- Mô tả nội dung môn học:

To those working at manufacturing factories: Observing and understanding the technological process of the main product(s) in the factories. Understanding the structure and operating manufacturing machines and equipment, and product QA and QC activities.

To those working at research institutes: Learning how to do a research: doing a research. Understanding research methods. Understanding analytical equipment and techniques. Operating research equipment and apparatus. Learning how to write a scientific paper.

To those working at health care service establishments: Observing and understanding procedures, regulations, structures of organizations providing health care services (clinical biochemistry, nutrition, drug preparation and development). Understanding different methods and standards.

12.72. Tên môn học (tiếng Anh, tiếng Việt): Thesis, Khóa luận tốt nghiệp

- Số tín chỉ: 12 (34.91 ECTS)
- Điều kiện tiên quyết/Môn học trước: Accumulated at least 113 Credits and have IELTS at least 5.5 or equivalent.
- Mô tả nội dung môn học: The research project is to give students an opportunity to deepen their theoretical knowledge by applying theory into practice. The studies also develop students' analytical skills, project management skills, social skills, and their ability to participate in Research and Development (R&D) work. The aim of the thesis is to

provide students with practice on how to undertake original research in the major fields offered by the School of Biotechnology, International University (IU). By the end of the research project, students will have gained experience in conducting independent research and should be capable of it.

TRƯỜNG KHOA



Nguyễn Văn Thuận

KT. HIỆU TRƯỞNG

PHÓ HIỆU TRƯỞNG



Đinh Đức Anh Vũ



Phụ lục I

NỘI DUNG ĐIỀU CHỈNH CHƯƠNG TRÌNH ĐÀO TẠO NGÀNH HÓA HỌC (CHƯƠNG TRÌNH HÓA SINH) KHÓA 2024 SƠ VỚI KHÓA 2023

(Đính kèm Quyết định số 761/QĐ-ĐHQT ngày 09 tháng 7 năm 2024
của Hiệu trưởng Trường Đại học Quốc tế)

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

STT	Tên môn học	Mã MH	Số tín chỉ	Nhóm
1	Logistics and Supply Chain Management	IS029IU	03	Tự chọn tự do

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

STT	Tên môn học	Mã MH	Số tín chỉ	Nhóm
1	Human Physiology	BT210IU	03	Tự chọn chuyên ngành
2	The chemistry of surfaces and interfaces	BTBC424IU	03	Tự chọn chuyên ngành
3	Molecular Diagnostics	BT351IU	03	Tự chọn chuyên ngành
4	Logistics Engineering and Supply Chain Design	IS078IU	03	Tự chọn tự do

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

Sinh viên khóa cũ sẽ tiếp tục đăng ký môn học Logistics Engineering and Supply Chain Design (IS078IU) thay thế cho môn Logistics and Supply Chain Management (IS029IU). Các môn bổ sung vào nhóm tự chọn chuyên ngành sẽ không ảnh hưởng đến các môn học của khóa cũ.

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

(Đính kèm Quyết định số 761/QĐ-ĐHQT ngày 09 tháng 7 năm 2024
của Hiệu trưởng Trường Đại học Quốc tế)



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Political and Administration Sciences

COURSE SYLLABUS

Course Name: Philosophy of Marxism and Leninism

Course Code: PE015IU

1. General information

<i>Module designation</i>	The course equips students with basic knowledge of Marxist-Leninist philosophy.					
<i>Semester(s) in which the module is taught</i>	Summer Semester (1 st year)					
<i>Person responsible for the module</i>	Lecturers at School of Political and Administration Sciences, VNU-HCM					
<i>Language</i>	Vietnamese					
<i>Relation to curriculum</i>	Compulsory					
<i>Teaching methods</i>	Lecture, group discussion, presentation					
<i>Workload (incl. contact hours, self-study hours)</i>			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
<i>Credit points</i>	3 credits (4.62 ECTS)					
<i>Required and recommended prerequisites</i>	None					
<i>Module objectives</i>	- The course equips students with the basic contents of the worldview and the Marxist-Leninist philosophical methodology. - Help students to apply knowledge about worldview, Marxist-Leninist philosophical methodology creatively in cognitive and practical activities, in order to solve problems of social life of country and time.					
<i>Tentative learning</i>	I. Knowledge					

<i>outcomes</i>	1. Philosophy and its role in social life 1.1. Conceptualize philosophy and some basic concepts 1.2. Recognize the opposition between materialism and idealism in solving the fundamental problem of philosophy 1.3. Understanding dialectical materialism - the highest developed form of it 1.4. Understand the birth, objects, functions and roles of Marxist-Leninist philosophy 2. Dialectical materialism 2.1. Understanding matter from the point of view of dialectical materialism 2.2. Understanding consciousness from the point of view of dialectical materialism 2.3. Resolving the relationship between matter and consciousness from the point of view of dialectical materialism 2.4. Understand dialectics and materialist dialectics 2.5. Understand the two basic principles of materialist dialectic and derive the methodological significance of each 2.6. Understand the pairs of basic categories of the material dialectic and derive the methodological meaning of each pair of categories 2.7. Understand the fundamental rules of the materialist dialectic and derive the methodological meaning of each one 2.8. Understand practice, perception, the role of practice in perception and truth 3. Historical materialism 3.1. Understand the role of production and its methods in the existence and development of society 3.2. Understand the dialectical relationship between forces of production and relations of production 3.3. Understand the dialectical relationship between infrastructure and market economy; the natural development of socio-economic forms 3.4. Understand class, class struggle; ethnicity and the relationship among class, nation and humanity 3.5. Understanding the state and social networks 3.6. Understand the dialectical relationship between social existence and social consciousness 3.7. Understand the nature of human beings; the phenomenon of alienation and liberation of man from the relationship between the individual and society, and

	from the role of the masses.															
	II. Skills Demonstrate the ability to generalize, think, debate, critique, and group work 1. Have the skill of generalizing to pick out keywords for each content and think systematically 2. Have skills in presenting, explaining, criticizing, debating and eloquent about theories being studied and researched based on practice 3. Have skills in social communication, cooperation and teamwork, sharing knowledge and experience, ability to run a group III. Attitudes Express consciousness and awareness during and after learning 1. Have a sense of responsibility to protect the science, revolution and humanity of Marxism-Leninism 2. Have a sense of personal responsibility towards the community 3. Have awareness of the need for lifelong learning and research and applying practically.															
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: period (1 period = 50 minutes) 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>1</td><td>I, T</td></tr><tr><td>Philosophy and its role in social life</td><td>15</td><td>T, U</td></tr><tr><td>Dialectical materialism</td><td>15</td><td>T, U</td></tr><tr><td>Historical materialism</td><td>14</td><td>T, U</td></tr></table>	Topic	Weight	Level	Introduction	1	I, T	Philosophy and its role in social life	15	T, U	Dialectical materialism	15	T, U	Historical materialism	14	T, U
Topic	Weight	Level														
Introduction	1	I, T														
Philosophy and its role in social life	15	T, U														
Dialectical materialism	15	T, U														
Historical materialism	14	T, U														
Examination forms	Class discussion; Group presentations and reports; Mid-term exam: essay (opened-book); Final exam: essay (closed-book)															
Study examination regulations and	1. Regulations for group presentations - Forming a group: 5 students/group. The deadline for group topic registration on the forum is session 2 or directly submit it to the lecturer at the exam. - Week 4 (4th session) begins in order. Note that the presenting groups need to fully show up and bring along all relevant documents. - Submission form: submit files and minutes of group work via email to the lecturer															

	2. Regulations on time, attendance and discipline in the course: attend class on time and at least 80% of the sessions (only to be absent for a maximum of 20%). Exam ban is applied to those who miss more than the regulated number of sessions. Students must have all test scores, lively discussions, constructive and serious statements in class.
<i>Materials</i>	1. Ministry of Education and Training (2019), <i>Giáo trình Triết học Mác - Lênin</i>, National Political Publishing House, Hanoi. 2. Ministry of Education and Training (2012), <i>Giáo trình Những Nguyên lý cơ bản của chủ nghĩa Mác - Lênin</i>, National Political Publishing House, Hanoi. 3. Governing Body (2008), <i>Giáo trình Triết học Mác-Lênin</i>, National Political Publishing House, Hanoi.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CLO	1	2	3	4	5	6	7	8
1	L							
2	M							L
3					L		M	

3. Planned learning activities and teaching methods

Week	Topics	CLO	Assessment	Teaching and Learning activities
1	Introduction	1,2		Lecture
2	Philosophy and its role in social life	1,2,3	Quiz	Lectures and Quiz
3	Dialectical materialism	1,2,3	Quiz Final exam	Lectures and Quiz

4	Historical materialism	1,2,3	Group presentation Final exam	Lectures and HW

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Group presentation (15%)	70% Pass	70% Pass	70% Pass
Midterm exam (20%)	80% Pass		
Discussion in class (15%)		70% Pass	70% Pass
Final exam (50%)	80%Pass	80%Pass	

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

Date revised: May, 2023

School of Political and Administration Sciences

<i>Module designation</i>	The program consists of 6 chapters, in which Chapter 1 discusses the Objects, research methods and functions of Marxist-Leninist political economy; the remaining chapters present the core content of Marxist-Leninist Political Economy according to the module's objectives. Specifically, the content includes commodities, markets and the role of stakeholders; producing surplus value; competition and monopoly; socialist-oriented market economy and economic interest relations in Vietnam; and industrialization, modernization, and international economic integration in Vietnam.						
<i>Semester(s) in which the module is taught</i>	Summer Semester (1 st year)						
<i>Lecturer</i>	Lecturers at School of Political and Administration Sciences, VNU-HCM						
<i>Language</i>	Vietnamese						
<i>Relation to curriculum</i>	Compulsory						
<i>Teaching methods</i>	Lecture, group discussion, presentation						
<i>Workload (incl. contact hours, self-study hours)</i>			Lecture	Lab			
		<i>Credit</i>	2				
	Contact hours	25	25	0			
	Self-Study hours	60	60	0			
	Total workload	85	85	0			
<i>Credit points</i>	2 credits (3.08 ECTS)						
<i>Required and recommended</i>	Marxist-Leninist philosophy						

<i>prerequisites</i>	
<i>Module objectives</i>	Firstly, to equip students with fundamental knowledge of Marxist-Leninist political economy in the context of economic development of the country and the world today; to ensure the basic, systematic, scientific, and up-to-date knowledge associated with practice, creativity, skills, thinking, and traits of students, as well as to enhance the interdisciplinary and non-overlapping interoperability, also reduce the amount of academic or outdated material for college and university non-theoretical students. Secondly, on that basis, to form the mindset, skills of analysis, evaluation, and identification of the nature of economic benefit relations in the country's socio-economic development, contributing to helping students build appropriate social responsibility in the job position and life after graduation. Thirdly, to contribute to building the stance and ideology of Marxism-Leninism towards students.
<i>Tentative learning outcomes</i>	I. Knowledge 1. Objects, research methods and functions of Marxist-Leninist political economy 1.1. Understanding the formation and development of Marxist-Leninist political economy 1.2. Identify the research object of Marxist-Leninist political economy 1.3. Understand the research method of Marxist-Leninist political economy 1.4. Understand the functions of Marxist-Leninist political economy course 2. Commodities, markets, and the role of stakeholders 2.1. Understand the definition and the conditions for the production of goods 2.2. Understanding the commodity, its two attributes, and the relationship between them 2.3. Understand the relationship between the duality of commodity-producing labor and the two attributes of commodities 2.4. Understand the quality and quantity of the good's value and the affecting factors 2.5. Understand the origin, nature and function of money 2.6. Understanding the market, the role of the market, the market mechanism and the market economy 2.7. Understand some key patterns of the market economy 2.8. Understand the role of stakeholders 3. Surplus value in a market economy 3.1. Understand the concept, the general formula and contradiction of capital 3.2. Understand what the commodity labor is and why need to study it 3.3. Understand what surplus value is 3.4. Understanding the nature of capital accumulation 3.5. Understand the concepts: production cost, profit, profit margin, average profit,

	commercial profit, factors affecting profit rate 3.6. Understand what income is 3.7. Understanding capitalist rents, their types and land prices 4. Competition and monopoly in the market economy 4.1. Understand the relationship between competition and monopoly in a market economy 4.2. Understand the causes of monopoly formation in the market economy 4.3. Understanding the basic economic features of monopoly in capitalism from Lenin's viewpoint 4.4. Understand the causes of formation and development of state monopoly capitalism 4.5. Understand the nature and the main manifestations of state monopoly in capitalism 4.6. Understand the historical role of capitalism 5. Socialist-oriented market economy and economic interest relations in Vietnam 5.1. Understand the concept of a socialist-oriented market economy in Vietnam 5.2. Understand the objective necessity of developing a socialist-oriented market economy in Vietnam 5.3. Understanding the characteristics of the socialist-oriented market economy in Vietnam 5.4. Understand what the socialist-oriented market economy institution is and the need to improve it 5.5. Grasp the basic contents of improving the socialist-oriented market economy institution in Vietnam 5.6. Understand the concept and the relationship of economic benefits 5.7. Understand the role of the state in ensuring the harmonization of relations of interest 6. Vietnam's industrialization, modernization and international economic integration 6.1. Understand what the industrial revolution is and be able to generalize the historical revolutions 6.2. Understand the role of the industrial revolution for development 6.3. Understand the concept and typical models of industrialization in the world 6.4. Understand the objective necessity of industrialization and modernization in Vietnam 6.5. Understand the contents of industrialization and modernization in Vietnam 6.6. Understand industrialization and modernization in Vietnam in the context of the 4.0 industrial revolution. 6.7. Understand the concept and the reason why international economic integration an objective necessity 6.8. Understand the contents and positive and negative impacts of international economic integration 6.9. Grasp the direction of improving the efficiency of international economic integration in Vietnam's development

	II. Skills <i>Demonstrate the ability to generalize, think, debate, critique, and group work</i> 1. Have the skill of generalizing to pick out keywords for each content and think systematically 2. Have skills in presenting, explaining, criticizing, debating and eloquent about theories being studied and researched based on practice 3. Have skills in social communication, cooperation and teamwork, sharing knowledge and experience, ability to run a group III. Attitudes <i>Express consciousness and awareness during and after learning</i> 1. Have a sense of responsibility to protect the science, revolution and humanity of Marxism-Leninism 2. Have a sense of personal responsibility towards the community 3. Have awareness of the need for lifelong learning and research and applying practically.																					
<i>Content</i>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: period (1 period = 50 minutes) 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>1</td><td>I</td></tr><tr><td>Objects, research methods and functions of Marxist-Leninist political economy</td><td>2</td><td>I, T</td></tr><tr><td>Commodities, markets and the role of stakeholders</td><td>6</td><td>T</td></tr><tr><td>Surplus value in a market economy</td><td>6</td><td>T, U</td></tr><tr><td>Socialist-oriented market economy and economic interest relations in Vietnam</td><td>5</td><td>T, U</td></tr><tr><td>Vietnam's industrialization, modernization and international economic integration</td><td>5</td><td>T, U</td></tr></table>	Topic	Weight	Level	Introduction	1	I	Objects, research methods and functions of Marxist-Leninist political economy	2	I, T	Commodities, markets and the role of stakeholders	6	T	Surplus value in a market economy	6	T, U	Socialist-oriented market economy and economic interest relations in Vietnam	5	T, U	Vietnam's industrialization, modernization and international economic integration	5	T, U
Topic	Weight	Level																				
Introduction	1	I																				
Objects, research methods and functions of Marxist-Leninist political economy	2	I, T																				
Commodities, markets and the role of stakeholders	6	T																				
Surplus value in a market economy	6	T, U																				
Socialist-oriented market economy and economic interest relations in Vietnam	5	T, U																				
Vietnam's industrialization, modernization and international economic integration	5	T, U																				
<i>Examination forms</i>	Class discussion; Group presentations and reports; Mid-term exam: essay (opened-book); Final exam: essay (closed-book)																					
<i>Study and examination regulations</i>	1. Regulations for group presentations - Forming a group: 5 students/group. The deadline for group topic registration on the forum is session 2 or directly submit it to the lecturer at the exam. - Week 4 (4th session) begins in order. Note that the presenting groups need to fully show up and bring along all relevant documents. - Submission form: submit files and minutes of group work via email to the lecturer 2. Regulations on time, attendance, and discipline in the course: attend class on																					

	time and at least 80% of the sessions (only to be absent for a maximum of 20%). Exam ban is applied to those who miss more than the regulated number of sessions. Students must have all test scores, lively discussions, constructive and serious statements in class.
<i>Materials</i>	1. Mandatory document: Marxist-Leninist political economy textbook for non-specialized undergraduates. 2. Referential materials: a) Robert, J.R. & Robert, F. H. (2003), <i>History of economic theory and method (in Vietnamese)</i>, Statistical Publishing House. b) Politic Economy Institute, Ho Chi Minh National Academy of Politics (2018), <i>Giáo trình Kinh tế chính trị Mác - Lê nin</i>, Political Theory House. c) K. Marx and F.Engels, Full Volume (vol. 20, 23, 25), National Political Publishing House, 1994. d) V.I. Lenin, Full Volume, Progress Press, Moscow, 1976. e) Davig Begg, Stanley Fisher, Rudiger Dornbusch, <i>Kinh tế học</i>, Hanoi Education Publishing House, 1992.
	f) Communist Party of Vietnam (2016), Document of the 12th National People's Congress, National Political Publishing House, Hanoi. g) Communist Party of Vietnam (2016), Report summarizing some theoretical and practical problems through thirty years of renovation (1986 - 2016), National Political Publishing House, Hanoi. h) Communist Party of Vietnam (2017), Resolution No. 11-NQ/TW dated June 3, 2017 on: "Improving the socialist-oriented market economy institution" i) Directive No. 16/CT-TTg (2017) "on strengthening access to the 4.0 industrial revolution". j) Jeremy Rifkin (2014), <i>The third industrial revolution (in Vietnamese)</i>, Labor and Social Publisher Co. Ltd. k) Manfred B. Steger (2011), <i>Globalization - A Very Short Introduction</i>, Knowledge Publishing House. l) Klaus Schwab (2015), <i>The fourth industrial revolution</i>, National Political Publishing House, 2018.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CL O	1	2	3	4	5	6	7	8
1	L							
2	M	M						L
3							M	

3. Planned learning activities and teaching methods

Week	Topics	CLO	Assessment	Teaching and Learning activities
1	Introduction	1,2		Lecture
2	Objects, research methods and functions of Marxist-Leninist political economy	1,2,3	Quiz	Lectures and Quiz
3	Commodities, markets and the role of stakeholders	1,2,3	Quiz	Lectures and Quiz
4	Surplus value in a market economy	1,2,3	HW1	Lectures and HW
5	Socialist-oriented market economy and economic interest relations in Vietnam	1,2,3	Quiz	Lectures and Quiz
6	Vietnam's industrialization, modernization and international economic integration	1,2,3	HW2	Lectures and HW

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Group presentation (15%)	80% Pass	80%Pass	80%Pass
Midterm exam (20%)	80% Pass		
Discussion in class (15%)		80% Pass	80% Pass
Final exam (50%)	80% Pass	80%Pass	80%Pass

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

Date revised: May, 2023

School of Political and Administration Sciences



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Political and Administration Sciences

COURSE SYLLABUS

Course Name: Scientific Socialism

Course Code: **PE017IU**

1. General information

<i>Module designation</i>	The course equips students with basic knowledge of scientific socialism.				
<i>Semester(s) in which the module is taught</i>	Semester 1 (2 nd year)				
<i>Person responsible for the module</i>	Lecturers at School of Political and Administration Sciences, VNU-HCM				
<i>Language</i>	Vietnamese				
<i>Relation to curriculum</i>	Compulsory				
<i>Teaching methods</i>	Lecture, group discussion, presentation				
<i>Workload (incl. contact hours, self-study hours)</i>			Lecture	Lab	
		Credit	2		
	Contact hours	25	25	0	
	Self-Study hours	60	60	0	
	Total workload	85	85	0	
<i>Credit points</i>	2 credits (3.08 ECTS)				
<i>Required and recommended prerequisites</i>	1. Marxist-Leninist political economy 2. Marxist-Leninist philosophy				
<i>Module objectives</i>	- The subject equips students with the basic contents of scientific socialism (one of the three constituent parts of Marxism-Leninism). - Help students to apply knowledge about scientific socialism creatively in cognitive and practical activities, in order to solve problems of social life of country and time.				
<i>Tentative learning outcomes</i>	I. Knowledge 1. Introduction to Scientific Socialism 1.1. Generalize the birth of Scientific Socialism, the historical background				

	and the role of Karl Marx and Friedrich Engels 1.2. Recognize the basic development stages of Scientific Socialism shown in the works 1.3. Understand the object, method and significance of the study of Scientific Socialism 2. The historical mission of the working class 2.1. Understand the concept of the working class and its characteristics 2.2. Understand the content and characteristics of the historical mission of the working class 2.3. Explain the conditions that determine the historical mission of the working class 2.4. Analyze the similarities and differences of the working class and the implementation of the mission of the them in the world today 2.5. Understand the basic characteristics of the Vietnamese working class and the content of the historical mission of them today 2.6. Present the direction and some key solutions to build the working class in Vietnam today 3. Socialism and the transition to socialism 3.1. Understanding Socialism is the first stage of the socialist-economic form of communism 3.2. Describe the basic features of socialism 3.3. Explain the objective necessity of the transition to socialism and the basic features of it 3.4. Understand the characteristics of the transition period and socialism in Vietnam, present the directions to build socialism in Vietnam today 4. Democracy and the socialist state 4.1. Explain the concept of democracy and the birth and development of democracy in the history of human society 4.2. Understand the birth process and nature of socialist democracy 4.3. Understand the birth, nature and function of the socialist state as well as the relationship between democracy and the state 4.4. Understand the birth, development and nature of socialist democracy in Vietnam 4.5. Present the basic characteristics and solutions to build a legal socialist state in Vietnam today 5. Social structure - classes and alliances of classes and classes in the transition to socialism 5.1. Present the concept of social structure - generalization and the change of class social structure during the transition to socialism 5.2. Explain the inevitability of class alliances during the transition to socialism 5.3. Understand the social-class structure in Vietnam during the transitional period and present basic solutions to build and develop class alliances and social classes in Vietnam 6. Ethnic and religious issues in the transition to socialism 6.1. Understand the basic concepts and characteristics of the nation and the Marxist-Leninist point of view on the national issue

	6.2. Present the basic characteristics of the nation in Vietnam and the viewpoints on ethnic policies of the Party and State of Vietnam. 6.3. Understanding the nature, origin, features of religion and basic principles of solving religious problems in the transition to socialism 6.4. Explain the characteristics of religion in Vietnam and the policies of the Party and State of Vietnam towards religious beliefs today 6.5. Understand the characteristics of ethnic and religious relations in Vietnam and present basic orientations to solve the relationship between ethnicity and religion in Vietnam today 7. Family problems in the transition to socialism 7.1. Outline the position, function and role of the family in society 7.2. Identify the bases for building a family during the transition to socialism 7.3. Explain the change of the Vietnamese family and present the basic directions for building and developing the Vietnamese family during the transition to socialism															
	II. Skills <i>Demonstrate the ability to generalize, think, debate, critique, and group work</i> 1. Have the skill of generalizing to pick out keywords for each content and think systematically 2. Have skills in presenting, explaining, criticizing, debating and eloquent about theories being studied and researched based on practice 3. Have skills in social communication, cooperation and teamwork, sharing knowledge and experience, ability to run a group III. Attitudes <i>Express consciousness and awareness during and after learning</i> 1. Have a sense of responsibility to protect the scientific and revolutionary nature of Marxist-Leninist theories on socialism and the transition to socialism in Vietnam 2. Have a sense of personal responsibility towards the community 3. Have awareness of the need for lifelong learning and research and applying practically															
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: period (1 period = 50 minutes) 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>1</td><td>I, T</td></tr><tr><td>Introduction to Scientific Socialism</td><td>4</td><td>I, T</td></tr><tr><td>The historical mission of the working class</td><td>4</td><td>T</td></tr><tr><td>Socialism and the transition to socialism</td><td>4</td><td>I, T</td></tr></table>	Topic	Weight	Level	Introduction	1	I, T	Introduction to Scientific Socialism	4	I, T	The historical mission of the working class	4	T	Socialism and the transition to socialism	4	I, T
Topic	Weight	Level														
Introduction	1	I, T														
Introduction to Scientific Socialism	4	I, T														
The historical mission of the working class	4	T														
Socialism and the transition to socialism	4	I, T														

	Democracy and the socialist state	4	T, U
	Social structure - classes and alliances of classes and classes in the transition to socialism	4	I, T
	Ethnic and religious issues in the transition to socialism	4	T, U
	Family problems in the transition to socialism	5	T, U
<i>Examination forms</i>	Class discussion; Group presentations and reports; Practices; Mid-term exam; Final exam		
<i>Study and examination regulations</i>	1. Regulations for group presentations - Forming a group: 5 students/group. The deadline for group topic registration on the forum is session 2 or directly submit it to the lecturer at the exam. - Week 4 (4th session) begins in order. Note that the presenting groups need to fully show up and bring along all relevant documents. - Submission form: submit files and minutes of group work via email to the lecturer 2. Regulations on time, attendance, and discipline in the course: attend class on time and at least 80% of the sessions (only to be absent for a maximum of 20%). An exam ban is applied to those who miss more than the regulated number of sessions. Students must have all test scores, lively discussions, constructive and serious statements in class.		
<i>Materials</i>	1. Ministry of Education and Training. (2019). <i>Giáo trình Chủ nghĩa xã hội khoa học</i>, National Political Publishing House, Hanoi. 2. Ministry of Education and Training. (2012). <i>Giáo trình Những Nguyên lý cơ bản của chủ nghĩa Mác - Lênin</i>, National Political Publishing House, Hanoi. 3. Governing Body. (2008). <i>Giáo trình Chủ nghĩa xã hội khoa học</i>, National Political Publishing House, Hanoi.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs

CL O	1	2	3	4	5	6	7	8
1	L							
2	M							L
3					L		M	

3. Planned learning activities and teaching methods

Week	Topics	CLO	Assessment	Teaching and Learning activities
1	Introduction	1		Lecture
2	Introduction to Scientific Socialism	1	Quiz	Lectures and Quiz
3	The historical mission of the working class	1	Quiz	Lectures and Quiz
4	Socialism and the transition to socialism	1	HW1	Lectures and HW
5	Democracy and the socialist state	1	Quiz	Lectures and Quiz
6	Social structure - classes and alliances of classes and classes in the transition to socialism		HW2	Lectures and HW
7	Ethnic and religious issues in the transition to socialism		Quiz	Lectures and Quiz
8	Family problems in the transition to socialism			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Group presentation (15%)	80% Pass		
Midterm exam (20%)	80% Pass		

Discussion in class (15%)	80% Pass	80% Pass	80% Pass
Final exam (50%)	80% Pass	80%Pass	

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

Date revised: May, 2023

School of Political and Administration Sciences



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Political and Administration Sciences

COURSE SYLLABUS

Course Name: History of Vietnamese Communist Party

Course Code: PE018IU

1. General information

<i>Module designation</i>	The course equips students with basic knowledge about the History of the Communist Party of Vietnam				
<i>Semester(s) in which the module is taught</i>	Semester 1 (3 rd year)				
<i>Person responsible for the module</i>	Lecturers at School of Political and Administration Sciences, VNU-HCM				
<i>Language</i>	Vietnamese				
<i>Relation to curriculum</i>	Compulsory				
<i>Teaching methods</i>	Lecture, group discussion, presentation				
<i>Workload (incl. contact hours, self-study hours)</i>			Lecture	Lab	
		Credit	2		
	Contact hours	25	25	0	
	Self-Study hours	60	60	0	
	Total workload	85	85	0	
<i>Credit points</i>	2 credits (3.08 ECTS)				
<i>Required and recommended prerequisites</i>	1. Marxist-Leninist philosophy 2. Marxist-Leninist political economy 3. Scientific socialism				
<i>Module objectives</i>	1. Knowledge: providing systematic and basic knowledge about the birth of the Communist Party of Vietnam (1920-1930), the Party's leadership over the Vietnamese revolution during the struggle for power (1930-1945), the two resistance wars against French and US colonialism (1945-1975), and national construction and defense during the period of the country's transition to socialism and carrying out the renovation work (1975-2018).				

	2. Ideology: Through historical events and experiences to build a sense of respect for objective truths, raise pride and confidence in the Party's leadership. 3. Skills: Equip with scientific thinking methods on history, skills in choosing research materials and studying subjects; and the ability to apply historical awareness to practical work and critical thinking toward false claims about the history of the Party.
Tentative learning outcomes	I. Knowledge 1. Objects, functions, tasks, contents and methods of research and study History of the Communist Party of Vietnam Understand the objects, purposes of study and research and some basic requirements on learning and research methods 2. The Communist Party of Vietnam was born and led the struggle for power (1930-1945) 2.1. Understanding the historical context that influenced the birth of the Communist Party of Vietnam 2.2. Understand the process of preparing the conditions for the establishment of the Party of Nguyen Ai Quoc 2.3. Understand the contents of the Party's founding conference and the Party's first political platform 2.4. Understand the historical significance of the establishment of the Communist Party of Vietnam 2.5. Understanding the revolutionary movements of 1930-1935 and the policies of restoring the movement in 1932-1935 2.6. Understanding the democracy movement in 1936-1939 2.7. Understanding the national liberation movement in 1939-1945 2.8. Understanding the nature, meaning and experience of the August Revolution in 1945 3. The Party led two resistance wars, completed the national liberation and reunification (1945-1975) 3.1. Understand the policy of building and defending the revolutionary government in 1945-1946 3.2. Understand the line of national resistance against the French colonialists and the process of organizing its implementation from 1946 to 1950 3.3. Understand the policy of promoting the resistance against the French colonialists and the implementation process from 1946 to 1950 3.4. Understand the historical significance and experience of the Party in leading the resistance war against French colonialism and US intervention 3.5. Understanding the Party's process of leading the two regions' revolutions in the 1954-1965 period 3.6. Mastering the Party's revolutionary leadership in the 1965-1975 period 3.7. Understand the meaning and experience of the Party's leadership in the resistance war against the US in 1954-1975
	4. The Party led the country in the transition to socialism and carried out the Doi moi (1975-2018)

	4.1. Understand the policy of building socialism and defending the Fatherland 1975-1981 4.2. Understanding the contents of the 5th National Congress of the Party and the breakthroughs to continue economic renovation 1982-1986 4.3. Understanding the Party's point of view of comprehensive renovation, bringing the country out of the 1986-1996 socio-economic crisis 4.4. Understand the achievements and experiences of the innovation process 4.5. Understand the great victories of the Vietnamese revolution under the leadership of the Party 4.6. Understanding the great lessons of the Party's leadership from 1930 to 2018 II. Skills <i>Demonstrate the ability to generalize, think, debate, critique, and group work</i> 1. Exercise independent thinking capacity in researching the Party's revolutionary lines, strategies and tactics 2. Have critical thinking, analytical, synthesis and evaluation skills related to the subject; and from there, apply the learned knowledge to actively and actively perceive political, economic, cultural and social issues according to the guidelines, policies and laws of the Party and State. 3. Have writing skills, individual working skills, teamwork skills, and presenting research results III. Attitudes <i>Express consciousness and awareness during and after learning</i> 1. Believe in the Party's leadership for the Vietnamese revolution 2. Determine to strive for the implementation of the Party's revolutionary line 3. Have a serious attitude in learning, scientific research, awareness of life and society, self-training to become a person of solid political quality, bravery, ethics, and good level of expertise; form affection and belief in the revolutionary path that our nation has chosen															
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: period (1 period = 50 minutes) 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>1</td><td>I, T</td></tr><tr><td>Objects, functions, tasks, contents and methods of research and study History of the Communist Party of Vietnam</td><td>4</td><td>I, T</td></tr><tr><td>The Communist Party of Vietnam was born and led the struggle for power (1930-1945)</td><td>5</td><td>T</td></tr><tr><td>The Party led two resistance wars, completed</td><td>5</td><td>I, T</td></tr></table>	Topic	Weight	Level	Introduction	1	I, T	Objects, functions, tasks, contents and methods of research and study History of the Communist Party of Vietnam	4	I, T	The Communist Party of Vietnam was born and led the struggle for power (1930-1945)	5	T	The Party led two resistance wars, completed	5	I, T
Topic	Weight	Level														
Introduction	1	I, T														
Objects, functions, tasks, contents and methods of research and study History of the Communist Party of Vietnam	4	I, T														
The Communist Party of Vietnam was born and led the struggle for power (1930-1945)	5	T														
The Party led two resistance wars, completed	5	I, T														

	the national liberation and reunification (1945-1975)		
	The Party led the country in the transition to socialism and carried out the Doi moi (1975-2018)	5	T, U
<i>Examination forms</i>	Class discussion; Group presentations and reports; Mid-term exam; Final exam		
<i>Study and examination regulations</i>	1. Regulations for group presentations - Forming a group: 5 students/group. The deadline for group topic registration on the forum is session 2 or directly submit it to the lecturer at the exam. - Week 4 (4th session) begins in order. Note that the presenting groups need to fully show up and bring along all relevant documents. - Submission form: submit files and minutes of group work via email to the lecturer 2. Regulations on time, attendance and discipline in the course: attend class on time and at least 80% of the sessions (only to be absent for a maximum of 20%). Exam ban is applied to those who miss more than the regulated number of sessions. Students must have all test scores, lively discussions, constructive and serious statements in class.		
Materials	1. Ministry of Education and Training. (2019). <i>Chương trình môn học Lịch sử Đảng Cộng sản Việt Nam</i>. 2. Governing Body directed the compilation of national textbooks of Marxist-Leninist sciences, Ho Chi Minh's Thoughts. (2018). <i>Giáo trình Lịch sử Đảng Cộng sản Việt Nam (revised and supplemented edition)</i>. National Political Publishing House, Hanoi.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CLO	1	2	3	4	5	6	7	8
1	L							
2								M
3	H							

3. 3. Planned learning activities and teaching methods

Week	Topics	CLO	Assessment	Teaching and Learning activities
1	Introduction	1,2		Lecture
2	Objects, functions, tasks, contents and methods of research and study History of the Communist Party of Vietnam	1	Quiz	Lectures and Quiz
3	The Communist Party of Vietnam was born and led the struggle for power (1930-1945)	1	Quiz	Lectures and Quiz
4	The Party led two resistance wars, completed the national liberation and reunification (1945-1975)	1,2	HW1	Lectures and HW
5	The Party led the country in the transition to socialism and carried out the Doi moi (1975-2018)	1,2	Quiz	Lectures and Quiz

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Group presentation (20%)	80% Pass	80% Pass	
Midterm exam (30%)	80% Pass		
Discussion in class (Plus 1 point maximum into final exam)			
Final exam (50%)	80% Pass		

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

Date revised: May, 2023



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
 School of Political and Administration Sciences

COURSE SYLLABUS

Course Name: Ho Chi Minh's Thoughts

Course Code: PE019IU

1. General information

<i>Module designation</i>	The course equips students with basic knowledge about subjects, research methods and meaning of Ho Chi Minh's ideologies; origin of Ho Chi Minh's ideologies; national independence and socialism; Communist Party of VietNam and the Vietnamese State; great national unity and international solidarity; culture, morality and human.				
<i>Semester(s) in which the module is taught</i>	Semester 1 (3 rd year)				
<i>Person responsible for the module</i>	Lecturers at School of Political and Administration Sciences, VNU-HCM				
<i>Language</i>	Vietnamese				
<i>Relation to curriculum</i>	Compulsory				
<i>Teaching methods</i>	Lecture, group discussion, presentation				
<i>Workload (incl. contact hours, self-study hours)</i>			Lecture	Lab	
		<i>Credit</i>	2		
Contact hours	25		25	0	
Self-Study hours	60		60	0	
Total workload	85		85	0	
<i>Credit points</i>	2 credits (3.08 ECTS)				
<i>Required and recommended prerequisites</i>	1. Marxist-Leninist philosophy 2. Marxist-Leninist political economy 3. Scientific socialism				

Module objectives	Knowledge: Equip students with basic knowledge about the concept, origin, process of formation and development of Ho Chi Minh's thoughts; the basic contents of Ho Chi Minh's thoughts; the application of the Communist Party of Vietnam in the national-democratic and socialist revolution in the current national renewal process. Skills: Form the skills of independent thinking, analyzing, evaluating and applying Ho Chi Minh's thought creatively to solve problems in life, study and work. Attitudes: Help students improve their political bravery, patriotism, loyalty to the goals and ideals of national independence associated with socialism; aware of the role and value of Ho Chi Minh's thoughts for the Vietnamese Party and nation; aware their responsibility in studying and training to contribute to the construction and defense of the Fatherland.
Tentative learning outcomes	I. Knowledge 1. Concept, subject, research methodology and meaning of Ho Chi Minh ideology module 1.1. Understand the concept of Ho Chi Minh's thoughts 1.2. Understand the research object 1.3. Grasp some basic requirements on learning and research methods of Ho Chi Minh's ideology 1.4. Understand the meaning of learning ideological course 2. The foundation, formation and development of Ho Chi Minh ideology 2.1. Understand the practical basis, theoretical premise and subjective factors forming Ho Chi Minh's thoughts 2.2. Understand the process of formation and development of Ho Chi Minh's thoughts 2.3. Grasp the value of Ho Chi Minh's thoughts for the Vietnamese revolution and the progressive development of mankind 3. Ho Chi Minh ideology on national independence and socialism 3.1. Aware of the scientific, revolutionary and creative nature of Ho Chi Minh's thoughts on national independence and liberation revolution 3.2. Grasp Ho Chi Minh's view on the necessity of socialism, building socialism and the transition period to socialism in Vietnam 3.3. Understand Ho Chi Minh's view on the relationship between national independence and socialism 3.4. Apply Ho Chi Minh's thoughts on national independence associated with socialism in the current revolution
	4. Ho Chi Minh ideology on the Communist Party of Vietnam of the people, by the people and for the people 4.1. Understand the basic contents of Ho Chi Minh's thoughts on the Communist Party of Vietnam 4.2. Understand the basic contents of Ho Chi Minh's thoughts on the state of the people, by the people, for the people 4.3. Apply Ho Chi Minh's thoughts to the construction of the Party and the State 5. Ho Chi Minh ideology on national great unity and international solidarity

	5.1. Understand the basic views of Ho Chi Minh's thoughts on great national unity 5.2. Understand the basic views of Ho Chi Minh's thoughts on international solidarity 5.3. Apply Ho Chi Minh's thoughts on great national unity and international solidarity in the current period 6. Ho Chi Minh ideology on culture, morality and human 6.1. Grasp basic knowledge of Ho Chi Minh's thoughts on culture 6.2. Grasp basic knowledge of Ho Chi Minh's thoughts on new morality (revolutionary morality) 6.3. Grasp the basic knowledge of Ho Chi Minh's thoughts on culture 6.4. Apply Ho Chi Minh's thoughts on culture, morality and people in building the current Vietnamese culture, morality and human II. Skills Demonstrate the ability to generalize, think, debate, critique, and group work 1. Have skills in thinking, analyzing and evaluating Ho Chi Minh's thoughts. 2. Have skills in presenting, explaining, criticizing, debating and eloquent about theoretical knowledge being studied and researched based on practice. 3. Have skills in creatively applying Ho Chi Minh's thoughts to solving practical problems in life, study and work. III. Attitudes 1. Recognize the role and value of Ho Chi Minh's thoughts for the Party and nation of Vietnam 2. Have political bravery, patriotism, loyalty to the goals and ideals of national independence associated with socialism 3. Recognize responsibility in studying, researching and applying knowledge in life to contribute to national construction and defense																		
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: period (1 period = 50 minutes) Teaching levels: I (Introduce); T (Teach); U (Utilize) <table><tr><th>Topic</th><th>Weight</th><th>Level</th></tr><tr><td>Giới thiệu về môn học</td><td>1</td><td>I, T</td></tr><tr><td>Concept, subject, research methodology and meaning of Ho Chi Minh ideology module</td><td>2</td><td>T</td></tr><tr><td>The foundation, formation and development of Ho Chi Minh ideology</td><td>3</td><td>T</td></tr><tr><td>Ho Chi Minh ideology on national independence and socialism</td><td>3</td><td>T, U</td></tr><tr><td>Ho Chi Minh ideology on the Communist Party of Vietnam of the people, by the people and for the people</td><td>3</td><td>T, U</td></tr></table>	Topic	Weight	Level	Giới thiệu về môn học	1	I, T	Concept, subject, research methodology and meaning of Ho Chi Minh ideology module	2	T	The foundation, formation and development of Ho Chi Minh ideology	3	T	Ho Chi Minh ideology on national independence and socialism	3	T, U	Ho Chi Minh ideology on the Communist Party of Vietnam of the people, by the people and for the people	3	T, U
Topic	Weight	Level																	
Giới thiệu về môn học	1	I, T																	
Concept, subject, research methodology and meaning of Ho Chi Minh ideology module	2	T																	
The foundation, formation and development of Ho Chi Minh ideology	3	T																	
Ho Chi Minh ideology on national independence and socialism	3	T, U																	
Ho Chi Minh ideology on the Communist Party of Vietnam of the people, by the people and for the people	3	T, U																	

	Ho Chi Minh ideology on national great unity and international solidarity	3	T, U
	Ho Chi Minh ideology on culture, morality and human	3	I, T
<i>Examination forms</i>	Class discussion; Group presentations and reports; Mid-term exam: Multiple choice (closed-book) or essay (opened-book); Final exam: Essay (opened-book)		
<i>Study and examination regulations</i>	- Regulations on assessment: according to the Regulations on the teaching and learning of Political Theory subjects of the School of Political and Administration Sciences. - Regulations on group presentation: Forming a group: 5 students/group. + The deadline for group topic registration on the forum is session 2. + Week 4 (4th session) begins to present in order. Note that the presenting groups need to fully show up and bring along all relevant documents. + Submission form: submit files and minutes of group work via email to the lecturer.		
<i>Materials</i>	1. Ministry of Education and Training (2019). <i>Giáo trình Tư tưởng Hồ Chí Minh</i>, National Political Publishing House, Hanoi. 2. School of Political and Administration Sciences VNU-HCM. <i>Tài liệu hướng dẫn học tập Tư tưởng Hồ Chí Minh</i>. 3. <i>Ho Chi Minh</i> (2011). Full volume, National Political Publishing House, Hanoi. 4. <i>Biography of Ho Chi Minh</i> (2016). National Political Publishing House, Hanoi.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILOs							
	1	2	3	4	5	6	7	8
1	M							
2		M						H
3	M							

3. Planned learning activities and teaching methods

Week	Topics	CLO	Assessment	Teaching and Learning activities

1	Introduction	1		Lecture
2	Concept, subject, research methodology and meaning of Ho Chi Minh ideology module	1	Quiz	Lectures and Quiz
3	The foundation, formation and development of Ho Chi Minh ideology	1	Quiz	Lectures and Quiz
4	Ho Chi Minh ideology on national independence and socialism	1	HW1	Lectures and HW
5	Ho Chi Minh ideology on the Communist Party of Vietnam of the people, by the people and for the people	1	Quiz	Lectures and Quiz
6	Ho Chi Minh ideology on national great unity and international solidarity		HW2	Lectures and HW
7	Ho Chi Minh ideology on culture, morality and human		Quiz	Lectures and Quiz

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Group presentation (15%)	80% Pass		
Midterm exam (20%)	80% Pass		
Discussion in class (15%)	80% Pass	80% Pass	80% Pass
Final exam (50%)	80% Pass	80% Pass	

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

Date revised: May, 2023

School of Political and Administration Sciences



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
Office of Academic Affairs

COURSE SYLLABUS

Course Name: General Law

Course Code: PE021IU

1. General information

Department	Office of Academic Affairs					
Course classification	Foundation course					
Course designation	Face to face					
Semester(s) in which the course is taught	All semesters in each academic year					
Person responsible for the course	Dr. Vo Tuong Huan LLM. Bui Doan Danh Thao					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Student-centred approach					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites	N/A					

for joining the course									
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: <table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td> CLO1. Apply appropriate legal knowledge in the Vietnamese legal system to solve legal issues in various social contexts for a fair sustainable lifelong being. CLO1.1. Apply general knowledge on state and law to solve legal issues in various social contexts for a fair sustainable lifelong being. CLO1.2. Apply principle legal norms in some law branches such as constitution, civil, criminal, labor and administrative law to solve legal issues in various social contexts for a fair sustainable lifelong being. </td></tr> <tr> <td>Skill</td><td> CLO2. Communicate knowledge in the Vietnamese legal system to encourage people to raise their legal rights aiming for fair social/cultural moves. CLO3. Integrate ICTs to solve legal issues in various social contexts. </td></tr> <tr> <td>Attitude</td><td> CLO4. Detect the responsibility to ensure social and cultural fairness, including ending corruption, in various social contexts through understanding importance of law in social contexts. CLO5. Respond to the base for coexistence in various social contexts. </td></tr> </tbody> </table>	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.	Skill	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.	Attitude	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.
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.								
Skill	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.								
Attitude	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.								
Content	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.								
Examination forms	Multiple choice questions Case-based exams Essay exams Oral exams								
Study and examination requirements	To pass this course, the students must: • Achieve a composite mark of at least 50; and • Make a satisfactory attempt at all assessment tasks (see below). GRADING POLICY Grades can be based on the following: <table border="1"> <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 It is expected that the students will spend at least <i>six</i> 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.	Assignment	20%	Midterm examination	30%	Final examination	50%	Total	100%
Assignment	20%								
Midterm examination	30%								
Final examination	50%								
Total	100%								

	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 <i>before</i> attendance in classes. Required Course Texts and Materials <u>Legal Texts:</u> 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 <u>Books:</u> • PGS.TS. Phan Trung Hien, <i>Giáo trình Pháp Luật Đại cương</i>, NXB Chính Trị Quốc Gia Sự Thật 2022.

	• Mai Hong Quy (Chief Editor) (2nd 2017), <i>Introduction to Vietnamese Law</i>, Hong Duc Publishing House. <u>Additional materials provided in Blackboard</u> 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 <u>Recommended Internet sites</u> 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) <u>Other Resources, Support and Information</u> 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. <u>Books:</u> • Nguyen Phu Trong, <i>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</i>, NXB Chính Trị Quốc Gia Sự Thật 2023. • University of Law Ho Chi Minh City, <i>Giáo trình luật Hiến pháp Việt nam</i>, NXB Hồng Đức 2023. • University of Law Ho Chi Minh City, <i>Giáo trình Luật hành chính</i>, NXB Hồng Đức 2022. • University of Law Ho Chi Minh City, <i>Giáo trình Luật hình sự Việt Nam</i>, NXB Hồng Đức 2022. • University of Law Ho Chi Minh City, <i>Giáo trình Luật dân sự Việt Nam</i>, NXB Hồng Đức 2022. • University of Law Ho Chi Minh City, <i>Giáo trình Luật lao động Việt Nam</i>, NXB Hồng Đức 2022. • University of Law Ho Chi Minh City, <i>Giáo trình pháp luật về chủ thể kinh doanh</i>, NXB Hồng Đức 2022.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning

Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1		M						
2					M			
3		H						
4					M			
5		M						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to State - What is State? - Nature of state - Forms of state - Functions of state - Introduction to structure of Vietnamese state	1-5 (level I - introduced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT - Introduction to Vietnamese legal system available on Blackboard
2	Introduction to law? - What is law? - Nature of law - Forms of law - Structure of law - Categorization of legal system. - Enforcement - Breach of law and liabilities for breach of law - Introduction to structure of Vietnamese legal system	1-5 (level I - introduced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT - Introduction to Vietnamese legal system available on Blackboard
3	Constitutional Law - General introduction on Vietnamese Constitution and its nature and basic principles. - Political, economic and other regimes of Vietnam - Basic rights and responsibilities of	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

	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) - Crimes related to corruption - Punishments for corruption	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies, especially cases related to corruption	PPT– Criminal law available on Blackboard Criminal code 2015 available on Blackboard
8	Revision for mid-term exam		Quizzes Projects		
9	Civil Law (Part I) Definition and nature Civil law relationship	1-5 (Level R -	Tests Peer evaluations Class-	Discussions Case studies	PPT– Civil law available on Blackboard

	• Subject of civil law • Property and ownership • Civil transactions	reinforced)	performance evaluations		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 having scores greater than 50 out of 100.

5. Rubrics

No .	CLOs	Criteria	COMPLETELY FAIL Below 30%	INADEQUATE 30% – 49%	ADEQUATE 50% - 69%	ABOVE AVERAGE 70% - 89%	EXEMPLARY ≥ 90%
1	CLO 1	Organisation and clarification	No evidence of organization and coherence	Does not organise ideas logically and with clarification Limited evidence of coherence Ideas lack consistence	Generally organised logically, with evidence of progression Occasionally, there may be a lack of focus or ideas may be tangential	Clear organization and progression. Responds appropriately and relevantly, although some ideas are underdeveloped	Response is focused, detailed and non-tangential. Shows a high degree of attention to logic and reasoning of points. Clearly leads the reader to the conclusion and stirs thought regarding the topic
2		Originality and usefulness of the analysis	Shows no ability to identify legal issues or a clear inability to gather the facts	Demonstrates an incomplete grasp of the task. There is no overall sense of creative coherence. Arguments are addressed incompletely.	Shows ability to identify legal issues, gather the facts and develop claims. Argument are addressed well but no links with evidence	Shows strong ability to identify legal issues, gather the fact and develop claims as well as link claims with evidence. Overall, an acceptable	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

						solution is offered and explained	
3		Use of data/information	Shows no effort to incorporate information from primary and secondary sources	Shows little information from sources. Poor handling of sources	Shows moderate amount of source information incorporated. Some key points supported by sources. Quotations may be poorly integrated into paragraphs. Some possible problems with source citations	Draws upon sources to support most points. Some evidence may not support arguments or may appear where inappropriate. Quotations integrated well into paragraphs. Sources cited correctly	Draws upon primary and secondary source information in useful and illuminating ways to support key points. Excellent integration of quoted material into paragraphs. Source cited correctly
4	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	Shows little attempt to offer support for key claims or to relate	Shows argument of poor quality. Weak, undeveloped reasons are	Shows clear, relevant and logical arguments.	Shows identifiable, reasonable and sound arguments. Clear reasons are offered to

			support analysis	evidence to analysis. Reasons offered are irrelevant.	offered to support key claims		support key claims.

Ho Chi Minh City, May 2023

Office of Academic Affairs



COURSE SYLLABUS

Course Name: Critical Thinking

Course Code: **PE008IU**

1. General information

Course designation	<i>This course provides the nature and techniques of thought as a basis for our claims, beliefs, and attitudes about the world. The course also explores the process in which people develop their claims and support their beliefs.</i> <i>Specifically, the course includes the theory and practice of presenting arguments in oral and written forms, making deductive and inductive arguments, evaluating the validity or strength of arguments, detecting fallacies in arguments, and refuting fallacious arguments.</i> <i>Resources for the reasoning process include hypothetical and real-life situations in various fields of natural sciences, social sciences, and humanities.</i>
Semester(s) in which the course is taught	1, 2, 3
Person responsible for the course	Trần Thanh Tú (Ph.D) Nguyễn Thị Thủy (Ph.D) Phạm Ngọc (Ph.D) Nguyễn Văn Tiếp (Ph.D) Vũ Tiến Thịnh (MA) Đỗ Thị Diệu Ngọc (MA)
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, homework assignments, students' presentations

Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	3				
	Contact hours	37.5	37.5	0			
	Self-Study hours	90	90	0			
	Total workload	127.5	127.5	0			
Credit points	3 credits (4.62 ECTS)						
Required and recommended prerequisites for joining the course	None						
Course objectives	This course will enable students to develop the habits of assessing and defending the reasonableness of their beliefs and values as well as those of others appreciate the importance of looking at an issue from a variety of perspectives apply critical thinking skills in both public and personal settings						
Course learning outcomes	Upon the successful completion of this course, students will be able to:						
	Competency level	Course learning outcome (CLO)					
	Knowledge	CLO1. Know the general concepts and standards of critical thinking; and comprehend the disadvantages of barriers to critical thinking in various contexts CLO2. Know the elements of an argument and two patterns of reasoning CLO3. Know the fallacies of relevance and insufficient evidence in arguments					
	Skill	CLO4. Construct and evaluate deductive and inductive arguments in spoken and written forms CLO5. Test the validity of deductive arguments using Venn diagram and truth tables CLO6. Analyze and standardize arguments CLO7. Evaluate truth claims and refute arguments CLO8. Analyze weaknesses in inductive arguments to strengthen them					
	Attitude	CLO9. Defend personal/group beliefs with good arguments and in appropriate manners (project presentations)					

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> 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>Introduction to Critical thinking</td><td>3</td><td>I, T, U</td></tr><tr><td>Recognizing arguments</td><td>3</td><td>T, U</td></tr><tr><td>Basic logical concepts</td><td>3</td><td>T, U</td></tr><tr><td>A little categorical logic</td><td>3</td><td>T, U</td></tr><tr><td>A little propositional logic</td><td>3</td><td>T, U</td></tr><tr><td>Logical fallacies I</td><td>3</td><td>T, U</td></tr><tr><td>Logical fallacies II</td><td>3</td><td>T, U</td></tr><tr><td>Review for Midterm test</td><td>3</td><td>U</td></tr><tr><td>Analyzing arguments</td><td>3</td><td>T, U</td></tr><tr><td>Evaluating arguments and truth claims</td><td>3</td><td>T, U</td></tr><tr><td>Inductive reasoning</td><td>3</td><td>T, U</td></tr><tr><td>Project: Group presentation</td><td>9</td><td>U</td></tr><tr><td>Review for Final Exam</td><td>3</td><td>U</td></tr></table>	Topic	Weight	Level	Introduction to Critical thinking	3	I, T, U	Recognizing arguments	3	T, U	Basic logical concepts	3	T, U	A little categorical logic	3	T, U	A little propositional logic	3	T, U	Logical fallacies I	3	T, U	Logical fallacies II	3	T, U	Review for Midterm test	3	U	Analyzing arguments	3	T, U	Evaluating arguments and truth claims	3	T, U	Inductive reasoning	3	T, U	Project: Group presentation	9	U	Review for Final Exam	3	U
Topic	Weight	Level																																									
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Logical fallacies II	3	T, U																																									
Review for Midterm test	3	U																																									
Analyzing arguments	3	T, U																																									
Evaluating arguments and truth claims	3	T, U																																									
Inductive reasoning	3	T, U																																									
Project: Group presentation	9	U																																									
Review for Final Exam	3	U																																									
Examination forms	40 multiple-choice questions for the midterm and final exams and group presentations for the final project																																										
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Overall passing score: 50/100																																										
Reading list	[1] Bassham, Irwin, Nardone, and Wallace, <i>Critical Thinking: A Student's Introduction</i> , 6 th edition, McGraw-Hill Education, 2020. [2] Moore, B.N. et al. (2009). <i>Critical Thinking</i> , 9th ed. McGraw-Hill [3] Patrick J. Hurley (2012). <i>A Concise Introduction to Logic</i> (11 th ed.), Wadsworth, Cengage Learning + Relevant web resources																																										

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-9) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	L							
2	L							
3	L							
4		M						
5		M						
6		H						
7		H						
8		H						
9								M

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Critical thinking	1	HW 1/Quiz 1	Lecture, Discussion, Homework, Quiz	[1] Chapter 1
2	Recognizing arguments	2	HW 2/Quiz 2	Lecture, Discussion, Homework, Quiz	[1] Chapter 2
3	Basic logical concepts	2	HW 3/Quiz 3	Lecture, Discussion, Homework, Quiz	[1] Chapter 3
4	A little categorical logic	3	HW 4/Quiz 4	Lecture, Discussion, Homework, Quiz	[1] Chapter 9
5	A little propositional logic	3	HW 5/Quiz 5	Lecture, Discussion, Homework, Quiz	[1] Chapter 10
6	Logical fallacies I	4	HW 6/Quiz 6	Lecture, Discussion, Homework, Quiz	[1] Chapter 5
7	Logical fallacies II	4	HW 7/Quiz 7	Lecture, Discussion, Homework, Quiz	[1] Chapter 6

8	Review for midterm exam + sample test				
9 + 10	Midterm exam: Chapters 1, 2, 3, 9, 10				
11	Analyzing arguments	5	HW 8/Quiz 8	Lecture, Discussion, Homework	[1] Chapter 7
12	Evaluating arguments and truth claims	5	HW 9/Quiz 9	Lecture, Discussion, Homework	[1] Chapter 8
13	Inductive reasoning	2	HW 10/Quiz 10	Lecture, Discussion, Homework	[1] Chapter 11
14	Project: Group presentation	6	Group work	Presentation, Discussion	
15	Project: Group presentation	6	Group work	Presentation, Discussion	
16	Project: Group presentation	6	Group work	Presentation, Discussion	
17	Review for final exam + sample test				
18	Reserved week				
19+20	Final exam: Chapters 5, 6, 7, 8, 11				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5	CLO 6	CLO 7	CLO 8	CLO 9
Class participation and Assignments (30%)	80% Pass	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	

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

Date revised: 15 August, 2022

School of Languages



COURSE SYLLABUS

Course Name: Writing AE1 (Academic Writing)

Course Code: EN007IU

1. General information

Course designation	<i>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.</i>				
Semester(s) in which the course is taught	1, 2, 3				
Person responsible for the course	Dang Duc Dung Le Minh Ha Nguyen Duc Phong Nguyen Anh Vu Nguyen Tran Thai Anh				
Language	English				
Relation to curriculum	Compulsory				
Teaching methods	Lecture, lesson, project				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	2		
	Contact hours	25	25	0	
	Self-Study hours	60	60	0	
	Total workload	85	85	0	
Credit points	2 credits (3.08 ECTS)				
Required and recommended prerequisites for joining the course	Students must fulfill ONE of the following requirements to attend this course: • hold TOEFL iBT certificate with score ≥ 61 • hold IELTS certificate with score ≥ 5.5				

	• have completed IE2 course		
Course objectives	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.		
Course learning outcomes	Upon the successful completion of this course, students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand and follow different steps in the writing process to produce a complete essay CLO2. Employ different methods to improve their writing such as peer feedback and teacher comments	
	Skill	CLO3. Read critically, analyze and annotate an academic text CLO4. Use different functions of writing to successfully communicate their purposes to the audience (describe a process, discuss the causes and effects, compare and contrast, make arguments, paraphrase and summarize)	
	Attitude	CLO5. Reason around ethical issues in writing academic essays and avoid committing plagiarism	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (2 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	The process of Academic Writing	1	I, T, U
	Using Outside Sources	3	T, U
	From Paragraph to Essay	4	T, U
	Process Essays	4	T, U
	Cause/Effect Essays	4	T, U
	Comparison/ Contrast Essays	4	T, U
Argumentative Essays	6	T, U	
Summarizing	2	U	

	Review & Correction	2	U
Examination forms	Essay writing		
Study and examination requirements	<i>Attendance</i> 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. <i>Missed Tests</i> Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may retake the examination. <i>Class Behaviors</i> 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. <i>Plagiarism</i> 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. <i>Writing Center (Room 509)</i> Students are encouraged to visit the Writing Center to schedule an appointment for additional help with essay writing.		
Reading list	1. Oshima, A., & Hogue, A. (2017). <i>Longman Academic Writing Series, Level 4: Essays</i> (5th ed.). New Jersey, NJ: Pearson Longman. 2. Oshima, A., & Hogue, A. (2006). <i>Longman Academic Writing Series, Level 4: Essays</i> (4th ed.). New Jersey, NJ: Pearson Longman.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILOs							
	1	2	3	4	5	6	7	8
1	L							
2		M						
3	M							
4								M
5					M			

3. Planned learning activities and teaching methods

Week	Coursebook		Homework
	Chapter	Pages	
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	[2] pp. 265- 279 [1] pp. 58- 65	- Do revising & editing exercises - Read pp. [1] pp. 66-72
2	Using Outside Sources (Cont'd) Strategies for writing a successful summary	[1] pp. 58 - 72	- Do paraphrasing exercises - Read [1] pp.74-100. Read, take notes and write the summary of ONE of the following articles: - The Challenge of Many Languages (p. 280) - Nice by Nature? (p. 281) - Marital Exchanges (pp. 283- 4) - Why We Should Send a Manned Mission to Mars (pp. 286-7) - Let's Not Go to Mars (pp. 288-9)

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] pp. 74 – 100	• Read pp. 101-15 • Do exercises on: ◦ Writing thesis statements ◦ Writing topic sentences from the thesis statement provided ◦ Writing restatements
5	Process Essays Introduction Analyzing the models Thesis statements for process essays Transitional signals Write together: Writing from a diagram (p.115)	[1] pp. 101 – 115	• Write a short essay (150-200 words) describing how hydroelectric power is generated (or a topic of the lecturer's choice)
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 major area or professional field • How to accomplish an academic task (register for classes, apply for a scholarship, pass an exam, etc.)	[1] pp. 101 – 115	• Read [1] pp. 116-132
7	Cause/ Effect Essays Introduction Analyzing the models Organization Signal words and phrases	[1] pp. 116 – 132	• Practice 4, 5,6 /pp. 127-9 • Write the introduction, ONE body paragraph and the conclusion on one of the topics below or a topic

	Write together: Write the introduction, ONE body paragraph and the conclusion on one of the topics below or a topic of the lecturer's choice: • The cause of obesity • The effects of involvement in sports on young children • The causes of stress in college students • The effects of regular reading on students' lives		of the lecturer's choice. The topic should be different from the one that has been used in class: ○ The cause of obesity ○ The effects of involvement in sports on young children ○ The causes of stress in college students ○ The effects of regular reading on students' lives
8	Cause/ Effect Essays (Cont'd) Review/ Correction: Lecturer gives feedback to one or two students' writings in class. <u>In-class Writing:</u> Write the introduction, ONE body paragraph 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 in sports on young children • The causes of stress in college students The effects of regular reading on students' lives		• Give peer-feedback using the rubric provided
MID-TERM EXAMINATION			
9	Comparison/ Contrast Essays Introduction Analyzing the models Organization: • Points of comparison • Point-by-point organization • Block organization Comparison and Contrast signal words Write together: Write the introduction, ONE body paragraph and the conclusion on one of the topics below or a topic of the lecturer's choice: • Compare and contrast the relationship between parents and children in two different cultures.	[1] pp. 133 - 151	• Practice 3, 4, 6, 7/pp.142-6 • Write the introduction, ONE body paragraph and the conclusion on one of the topics below or a topic of the lecturer's choice. The topic should be different from the one that has been used in class: ○ Compare and contrast the relationship between parents and children in two different cultures. • Compare and contrast the university culture

	• Compare and contrast the university culture in two different countries. • Compare and contrast the culture of a small town and a big city.		in two different countries. • Compare and contrast the culture 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. <u>In-class Assignment:</u> 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	[1] pp. 133 - 151	• Read [1] pp. 152-168
11 & 12	Argumentative Essays Introduction Analyzing the model	[1] pp. 152-168	• Write an argumentative essay (300 – 350 words) on ONE of the following topics or a topic

	Organization: Block vs. Point-by- point pattern The elements of an argumentative essay: • An explanation of the issue • A clear thesis statement • A summary of the opposing arguments • Rebuttals to the opposing arguments • Your own arguments The introductory paragraph: Thesis Statement Statistics as support Write together: Write the introduction, ONE body paragraph and the conclusion on one of the topics below 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?		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?
13	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?		• Give peer-feedback using the rubric provided
14	Review & Practice: Summarizing		Sample final test

15	Review/Correction: Lecturer gives feedback to one or two students' argumentative essays + sample final test in class. Lecturer has students check their own assignment scores.		
FINAL EXAMINATION			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Homework completion (10%)	80% Pass	80% Pass	80% Pass		
Week 6: In-class writing assignment: Process essay (10%)				80% Pass	
Week 10: In-class writing assignment: Compare & Contrast essay (10%)				80% Pass	
Midterm exam (30%)	80% Pass			80% Pass	80% Pass
Final exam (40%)				80% Pass	80% Pass

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

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

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 <i>Cause-Effect Essay</i> is good and Meaning is clear. Spelling, capitalization, punctuation are correct.	10	CLO 1,4
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 1,4,5
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 1,4
Total	60	

Final exam rubrics: Write an argumentative essay: 100 points

Criteria/ word count	300-350 words (100%)	200-299 words (80%)	Under 200 words (60%)	CLO
Language use and mechanics (20) A wide variety of sentence patterns and vocabulary are presented correctly. Language control is good, and meaning is clear. Spelling, capitalization and punctuation are correct.	20	16	12	CLO 1,4
Content: (20) The essay fulfills the task requirements, and the topic is fully addressed. The content is originally created by the students.	20	16	12	CLO 1,4,5

Organization: (60)				
Introduction:	10	8	6	
The introduction has a thesis statement. (10)	10	8	6	
Body:				
At least one paragraph discusses the counter-arguments. (10)	10	8	6	
Each paragraph discusses a particular point and begins with a clear topic sentence. (10)	10	8	6	
Each paragraph has specific supporting details (fact, examples, etc.). There are no sentences that are off-topic. (10)	10	8	6	CLO 1,4
Each paragraph has cohesion and coherence. There are transition signals to show the relationship among ideas and to link paragraphs. (10)	10	8	6	
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)				
Total	100	80	60	

Date revised: May, 2023

School of Languages



COURSE SYLLABUS

Course Name: Listening AE1 (Listening & Note-taking)

Course Code: EN008IU

1. General information

Course designation	<i>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.</i>				
Semester(s) in which the course is taught	1, 2, 3				
Person responsible for the course	Nguyen Duc Phong Do Hoang Nga Le Minh Ha Ly Nhut Thien				
Language	English				
Relation to curriculum	Compulsory				
Teaching methods	Lecture, lesson				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	2		
Contact hours	25		25	0	
Self-Study hours	60		60	0	
Total workload	85		85	0	
Credit points	2 credits (3.08 ECTS)				
Required and recommended prerequisites for joining the course	Students must fulfill 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									
Course objectives	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.									
Course learning outcomes	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. Remember different strategies and techniques in listening to academic lectures and taking notes. CLO2. Improve their specialized knowledge of academic lectures</td></tr><tr><td>Skill</td><td>CLO3. Respond to academic lectures with appropriate strategies CLO4. Communicate effectively with their classmates and professors.</td></tr><tr><td>Attitude</td><td>CLO5. Respond to academic lectures with confidence</td></tr></table>		Competency level	Course learning outcome (CLO)	Knowledge	CLO1. Remember different strategies and techniques in listening to academic lectures and taking notes. CLO2. Improve their specialized knowledge of academic lectures	Skill	CLO3. Respond to academic lectures with appropriate strategies CLO4. Communicate effectively with their classmates and professors.	Attitude	CLO5. Respond to academic lectures with confidence
Competency level	Course learning outcome (CLO)									
Knowledge	CLO1. Remember different strategies and techniques in listening to academic lectures and taking notes. CLO2. Improve their specialized knowledge of academic lectures									
Skill	CLO3. Respond to academic lectures with appropriate strategies CLO4. Communicate effectively with their classmates and professors.									
Attitude	CLO5. Respond to academic lectures with confidence									

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	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	
Examination forms	Paper and pen tests: Correct the mistakes, Fill in the blanks, Write short answers, Write a summary paragraph.		
Study and examination requirements	<i>Attendance</i> Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination. <i>Missed tests</i> 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 retake the tests.) <i>Class behavior</i> Students are supposed to: prepare thoroughly for each class in accordance with the syllabus and complete all assignments 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
Reading list	[1] Frazie, L., & Leeming, S. (2013). <i>Lecture ready 3</i> . Oxford: Oxford University Press. References: [2] Frazie, L., & Leeming, S. (2013). <i>Lecture ready 1, 2</i> . Oxford: Oxford University Press.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CLO	1	2	3	4	5	6	7	8
1	L							
2	M							
3								M
4								M
5								M

3. Planned learning activities and teaching methods

WEEK	P.	Chapter	Listening oriented activities	Speaking oriented activities
WEEK 1	2	ORIENTATION		
WEEK 2	2	<u>Chapter 1</u> New Trends in Marketing Research	Recognizing topic introducing and lecture plan presenting expressions Organizing ideas by outlining	Expressing ideas during a discussion
WEEK 3	2	<u>Chapter 2</u> Business Ethics	Recognizing transition expressions Using symbols and abbreviations	Asking for clarification and elaboration during a discussion
WEEK 4	2	REVIEW		
WEEK 5	2	<u>Chapter 3</u> Trends in Children's Media Use	Recognizing generalization and support expressions	Giving opinions and asking for opinions during a discussion

WEEK 6	2	<u>Chapter 4</u> The Changing Music Industry	Recognizing expressions for clarification or emphasis Organizing notes by using a split-page format	Expressing interest and asking for elaboration during a discussion
WEEK 7	2	<u>Chapter 5</u> The Placebo Effect	Recognizing cause and effect expressions Noting causes and effects	Agreeing and disagreeing during a discussion
WEEK 8	2	Sample test correction WRAP-UP AND REVIEW		
MID-TERM EXAMINATION				
WEEK 9	2	<u>Chapter 6</u> Intelligent Machines	Recognizing expressions used to predict causes and effects Using arrows to show the relationship between causes and effects	Learning to compromise and reach a consensus during a discussion
WEEK 10	2	REVIEW		
WEEK 11	2	<u>Chapter 7</u> Sibling Relationships	Recognizing expressions of comparison and contrast Noting comparison and contrast	Expanding on ideas during a discussion
WEEK 12	2	<u>Chapter 8</u> Multiple Intelligences	Recognizing non-verbal signals indicating important information Representing information in list form	Keeping the discussion on topic
WEEK 13	2	REVIEW		
WEEK 14	2	<u>Chapter 9</u> The Art of Graffiti	Recognizing expressions of definition Reviewing and practicing all note taking strategies	Indicating to other when preparing to speak or pausing to collect thoughts

WEEK 15	2	WRAP-UP AND REVIEW		
FINAL EXAMINATION				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
On-going assessment (30%) (participation, individual work, group work, assignments, etc.)	80% Pass	80% Pass	80% Pass	80% Pass	80% Pass
Midterm exam (30%)	80% Pass		80% Pass		
Final exam (40%)	80% Pass		80% Pass		

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

Date revised: May, 2023

School of Languages



COURSE SYLLABUS

Course Name: Writing AE2 (Research Paper Writing)

Course Code: EN011IU

1. General information

Course designation	<i>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.</i>					
Semester(s) in which the course is taught	1, 2, 3					
Person responsible for the course	Dang Thi Ngoc Lan					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, lesson, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	2			
	Contact hours	25	25	0		
	Self-Study hours	60	60	0		
	Total workload	85	85	0		
Credit points	2 credits (3.08 ECTS)					
Required and recommended prerequisites for joining the course	Students must complete Writing AE1 course					
Course objectives	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.		
Course learning outcomes	Upon the successful completion of this course, students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand the structure of a research paper and employ appropriate academic language in writing a research paper	
	Skill	CLO2. Read critically, analyze, and annotate academic articles and journals CLO3. Employ the research writing skills obtained to work on their own paper in their major study.	
	Attitude	CLO4. Reason around ethical issues in writing research paper and avoid committing plagiarism	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (2 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Unit 1: The Academic Writing Process Introduction	4	I, T, U
	Unit 2: Researching and Writing	2	T, U
	Unit 3: Fundamentals & Feedback	2	T, U
	Unit 4: Definitions, Vocabulary & Clarity	2	T, U
	Unit 5: Generalizations, Facts and Honesty	4	T, U
	Unit 6: Seeing Ideas and Sharing Texts	2	T, U
	Unit 7: Description, Methods & Reality	2	T, U
	Unit 8: Results, Discussion & Relevance	2	T, U
	Unit 9: The Whole Academic Text	2	T, U
	Unit 10: Creating the Whole Text	4	T, U
	Course Review	2	U

Examination forms	Essay writing
Study and examination requirements	<i>Attendance</i> 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. <i>Assignment (Literature review)</i> Purpose: Students will use the knowledge of paraphrasing, summarizing, developing arguments, and APA 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, summarizing, 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 papers must be original for this class. Criterion-referenced grading is used in this course. <i>Missed Tests</i> Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may re- take the examination. <i>Class Behaviors</i> 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 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. <i>Plagiarism</i> All forms of plagiarism and unauthorized 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 The rater will review the paper to check if citations or references are provided properly. Penalties due to improper citations or references include: <table border="1"> <thead> <tr> <th>Degree of magnitude</th><th>Description</th></tr> </thead> <tbody> <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> </tbody> </table> Notes: Part of the test is marked as it is if no plagiarism is detected. Students who plagiarize over 40% <u>twice</u> will be prohibited from sitting the final examination. <i>Writing Center (Room 509)</i> Students are encouraged to visit the Writing Center or to schedule an appointment for additional help.	Degree of magnitude	Description	Below 15%	Marked as it is.	15% - 25%	The score is deducted by 25%.	25% - 40%	The score is deducted by 50%	Over 40%	The score is 0.
Degree of magnitude	Description										
Below 15%	Marked as it is.										
15% - 25%	The score is deducted by 25%.										
25% - 40%	The score is deducted by 50%										
Over 40%	The score is 0.										
Reading list	[1] Hamp-Lyons, L., & Heasley, B. (2006). <i>Study Writing</i>. Cambridge, UK: Cambridge University Press [2] Articles and Essays taken from <i>The Allyn and Bacon Guide to Writing</i> by Ramage et al (2009), Pearson Longman. [3] Cormack, J. & Slaughter, J. (2009). <i>English for academic study: Extended writing and research skills</i>. Cambridge: Cambridge University Press. Garnet Education [4] Folse, K. S. & Pugh, T. (2010). <i>Great writing 5: Greater essays</i>. Boston: Heinle, Cengage Learning. [5] Keezer, S. (Ed.) (2003). <i>Write your research report: A real-time guide</i>. New Jersey: Pearson Learning Group. [6] Kumar, R. (2019). <i>Research methodology: A step-by-step guide for beginners</i>. Sage Publications										

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILO							
	1	2	3	4	5	6	7	8
1	M							
2		L						
3	M							
4					M			

3. Planned learning activities and teaching methods

WEEK	CONTENT—SUGGESTED TASKS	ASSIGNMENT/ HOMEWORK
1	Orientation of the Course <u>Unit 1: The Academic Writing</u> Process Introduction	
2	<u>Unit 1: The Academic Writing Process (Cont.)</u> Thinking about writing processes Distinguishing between academic and personal styles of writing Grammar of academic discourse	HW: Task 10
3	<u>Unit 2: Researching and Writing</u> Recognizing categories and classification The language of classification The structure of a research paper	HW: Task 17
4	<u>Unit 3: Fundamentals & Feedback</u> Exploring comparison and contrast structures The language of comparison and contrast Using comparisons and contrasts to evaluate and recommend	HW: Task 12
5	<u>Unit 3: Fundamentals & Feedback (Cont.)</u> The research paper Identifying a research gap The writing process	Assignment 1: Task 20
6	<u>Unit 4: Definitions, Vocabulary & Clarity</u> The clarity principle The language of definition The place of definition The writing process	HW: Task 15
7	<u>Unit 5: Generalizations, Facts and Honesty</u> Honesty principle The language of generalization	HW: Task 13

8	<u>Unit 5: Generalizations, Facts and Honesty (Cont.)</u> Writing a literature review The writing process Brainstorming and clustering APA 7th Style Guidelines – see https://www.apastyle.org/	Assignment 2: Writing Literature review
MID-TERM EXAMINATION		
9	<u>Unit 6: Seeing Ideas and Sharing Texts</u> Writing about events in time Connecting events Learning about peer reviews	HW: Tasks 12 & 13
10	<u>Unit 7: Description, Methods & Reality</u> Describing processes and products The language for writing about processes Writing the Methods section Giving and getting formal peer feedback	HW: Tasks 9 & 11
11	<u>Unit 8: Results, Discussion & Relevance</u> What is an argument? The language of argument The Results and Discussion sections Finding an academic voice	HW: Task 9
12	<u>Unit 9: The Whole Academic Text</u> S-P-S-E: Focus on structure S-P-S-E in the introduction The language of coherence and connection Teacher evaluation	HW: Task 9
13	<u>Unit 10: Creating the Whole Text</u> Structure of the research paper Creating your own research	
14	<u>Unit 10: Creating the Whole Text</u> Plagiarism Creating citations Paraphrase and summary Authorial identity	
15	Course Review	Submitting Literature review

FINAL EXAM

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Class participation and Assignments (30%)	80% Pass	80% Pass	80% Pass	
Midterm exam (30%)	80% Pass		80% Pass	80% Pass
Final exam (40%)	80% Pass		80% Pass	80% Pass

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics**a. Midterm exam sample rubrics (100 points)****TASK 1: 30 points**

CATEGORIES	CRITERIA	POINTS	CLO
Category	Farm animals seem to have more complex cognitive and social skills	7.5	CLO 1,2
Sub-category 1	1. Sheep experience stress a. increase stress (when isolated from the flock) b. reduce stress (when seeing familiar sheep faces)	7.5	
Sub-category 2	2. Cows' cooperative partnerships & physiological response on learning something new a. Those learning tasks experience an increase in heart rate (when facing the same situation). b. Those not learning tasks do not experience a heart rate increase.	7.5	CLO 1,2
Sub-category 3	3. Pigs' different reactions react differently based on past experience a. avoid the place where they have been shut for long b. go for the place where they were released from quickly.	7.5	CLO 1,2
Total		30	

TASK 2: 70 points

CATEGORIES	CRITERIA	POINTS	CLO
Content	All main points relevant to topic Essay question fully answers	20	CLO 1,3,4
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 1,3,4
Coherence	Paragraphs ordered in a systematic manner based on, for example, importance, priority, etc. Comparison/contrast transitions are properly used.	15	CLO 1,3,4
Style and Tone	Formal writing with full forms Polite writing Academic vocabulary	15	CLO 1,3,4
Total		70	

b. Final exam rubrics: 100 points

CATEGORIES	CRITERIA	POINTS	CLO
Content	Presenting his/her view on the question clearly and persuasively	20	CLO 1,3,4
Structure of ideas	- Introduction with thesis statement, and conclusion with summary and comment - Topic sentences well supported with explanations, examples, etc.	40	CLO 1,3,4
Convincing argumentative techniques, e.g., counterargument		20	CLO 1,3,4
Language use: <i>use vocabulary and grammatical structures</i>		20	CLO 1,3,4
Total		100	

Date revised: May, 2023

Course Code: **EN012IU**

Course designation	<i>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).</i>					
Semester(s) in which the course is taught	1, 2, 3					
Person responsible for the course	Do Hoang Nga					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, lesson, mini presentations					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	2			
	Contact hours	25	25	0		
	Self-Study hours	60	60	0		
	Total workload	85	85	0		
Credit points	2 credits (3.08 ECTS)					
Required and recommended prerequisites for joining the course	Students must complete AE1 courses					

Course objectives	Speaking AE2 aims at introducing and training students in many aspects of giving a presentation: building up confidence, preparing and planning, using the appropriate language, applying effective visual aids, applying delivery techniques, dealing with questions and responding, performing body language, and so on.																																								
Course learning outcomes	Upon the successful completion of this course, students will be able to:																																								
	Competency level	Course learning outcome (CLO)																																							
	Knowledge	CLO1. Understand 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																																							
	Skill	CLO2. Prepare and deliver effective, formal, structured presentations that are appropriate to the specific environment and audience.																																							
	Attitude	CLO3. Deliver both informative and persuasive speech with confidence																																							
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (2 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize) <table border="1"> <thead> <tr> <th>Topic</th><th>Weight</th><th>Level</th></tr> </thead> <tbody> <tr> <td>Orientation & Introduction</td><td>2</td><td>I, T, U</td></tr> <tr> <td>Needs analysis</td><td></td><td></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> </tbody> </table>		Topic	Weight	Level	Orientation & Introduction	2	I, T, U	Needs analysis			Building up confidence	2	T, U	The first few minutes	2	T, U	Organizing what you want to say	2	T, U	Summarizing and concluding	2	T, U	Using equipment	2	T, U	Delivery techniques: Putting it all together	2	T, U	Group presentations for the instructor's evaluation and advice	2	U	Introduction to persuasive speeches	2	T, U	Methods of persuasion	2	T, U	Maintaining interest	2	T, U
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Dealing with problems and questions	2	T, U								
Body language	2	T, U								
Individual presentations for the instructor's evaluation and advice	4	U								
Examination forms	Oral Presentations									
Study and examination requirements	<i>Attendance</i> 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. <i>Missed Tests</i> Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (e.g. certified paper from doctors), students may retake the examination. <i>Class Behaviors</i> Students are required to treat their studying in college as a full-time job and spend an adequate amount of time for this Speaking AE2 course with approximately 8-10 hours per week (both in class and self-study). Accordingly, students are supposed to follow the obligations below: • Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request. • Participate fully and constructively in all course activities and discussions (if any). • Display appropriate courtesy to all involved in the class. • Provide constructive feedback to faculty members regarding their performance. <i>Plagiarism</i> 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.									
Reading list	[1] Lowe, S, & Pile, L. (2010). <i>Presenting</i>. Singapore: Cengage Learning [2] Comfort, J. (1997). <i>Effective presentations</i>. Oxford: Oxford University Press [3] Lucas, S. (2014). <i>The art of public speaking</i> (12th edition). New York: McGraw-Hill Education. [4] Harrington, D., & Lebeau, C. (2009). <i>Speaking of speech</i>. Macmillan									

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILOs							
	1	2	3	4	5	6	7	8
1	M							
2								M
3								H

3. Planned learning activities and teaching methods

WEEK	Content	MATERIAL(S) COVERED	ACTIVITIES
WEEK 1	Orientation & Introduction Needs analysis	[1] <i>Presenting</i> , p. 5	Students will: receive an introduction to effective presentation think about their strength and weaknesses in presenting in English identify and prioritize their immediate and future needs for presenting share tips on improving weaknesses
WEEK 2	Building up confidence		Student will: - give a short speech about themselves to help them overcome initial shyness of standing up and speaking in public

WEEK 3	Unit 1: The first few minutes	• <i>Presenting</i>, pp. 8-13 • <i>Effective Presentations</i>: p.7 + video clip; p.13+ video clip	Students will: • learn the importance of making a good first impression • learn useful phrases for greeting the audience, introducing themselves and others, and giving the purpose of their presentation
WEEK 4	Unit 3: Organizing what you want to say	<i>Presenting</i>, pp. 22- 27) <i>Effective Presentations</i>: p.19 + video clip	Students will: look at the importance of structuring their presentation learn the useful phrases for outlining their presentation, organizing ideas and moving between different sections of their presentation
WEEK 5	Unit 6: Summarizing and concluding	<i>Presenting</i>, pp. 40- 45 <i>Effective Presentations</i>: p.41 + video clip	Students will: look at ways of finishing a presentation effectively learn useful phrases for ending their presentation, summarizing, handing over and thanking
WEEK 6	Unit 2: Using equipment	<i>Presenting</i>, pp. 14- 21) <i>Effective Presentations</i>: p.31 + video clip	Students will: use equipment and visuals to support their presentation learn useful phrases for referring to

			visuals, ensuring their audience can see and expanding on notes
WEEK 7	Delivery techniques: Putting it all together	[2] <i>Effective Presentations</i> : p.50 + video clip Assignment: Topic(s) for group presentation)	Students will: watch a model presentation and discuss do's and don'ts for effective delivery pick group members and plan their presentations for Week 8
WEEK 8	Group presentations for the instructor's evaluation and advice		Students will: take turn to deliver a presentation on the topic(s) assigned by the instructor consult the instructor for advice on the mid-term exam preparation
MIDTERM EXAMINATION			
Students will give a five-to-six minute informative presentation on a topic to be determined.			
WEEK 9	Introduction to persuasive speeches	[3] <i>The art of public speaking</i> , Chapter 15 (Handout given by the instructor)	Students will: - know types of persuasive speeches - know typical organizations of a persuasive speech
WEEK 10	Methods of persuasion	[3] <i>The art of public speaking</i> , Chapter 16 (Handout given by the instructor)	Students will learn to persuade the audience by: - building credibility - using evidence - reasoning - appealing to emotions

WEEK 11	Unit 4: Maintaining interest	<i>Presenting:</i> pp. 28- 33) <i>Effective Presentations:</i> p.25 + video clip)	Students will: look at maintaining interest through effective delivery learn useful phrases for clarifying what you mean, checking if the audience is following and involving the audience
WEEK 12	Unit 5: Dealing with problems and questions	<i>Presenting:</i> pp. 34- 39) <i>Effective Presentations:</i> p.44 (Question time)	Students will: learn strategies for coping in unexpected situations learn useful phrases for dealing with problems and questions
WEEK 13	Unit 6: Body language	[2] <i>Effective Presentations :</i> pp.36-39	Students will: practice using language and body language to communicate the message clearly and persuasively watch video clips about body language • learn how to control posture, eye contact, gestures and voice inflection
WEEK 14	Practice	(to be determined by the instructor)	Students will: - deliver individual or group presentations (assigned by the instructor)

WEEK 15	Wrap-up and advice	(to be determined by the instructor)	Students will: consult the instructor for advice on the final exam preparation continue to deliver individual or group presentations (if any)
FINAL EXAMINATION Students will deliver a seven-to-eight-minute persuasive presentation on a topic to be determined			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
On-going Assessment (30%) (discussion, group presentation, individual presentation, and so on) <i>(It is requested that lecturers collect students' scripts or any type of evidence of their participation for possible fact check).</i>	80% Pass	80% Pass	80% Pass
Midterm exam (30%) (Students will give a five-to-six-minute informative presentation on a topic to be determined)	80% Pass	80% Pass	80% Pass
Final exam (40%) (Students will deliver a seven-to-eight-minute persuasive presentation on a topic to be determined.)	80% Pass	80% Pass	80% Pass

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics & Marksheets

a. Midterm exam rubrics and marksheets

	Very Poor	Poor	Average	Good	Excellent
Pronunciation, Voice Techniques (Pauses, Volume, Speed Change, Stress, Tone, Etc)	- Mumbles, often mispronounces, very difficult to understand. - Dead person talking, voice to text software does better	- Slurred speech, mispronounces some words. Difficult to understand. - Quiet, monotone, sing/song, little or no expression, boring.	- Clear voice, few pronunciation errors. Some slurring. Most can understand the presentation - Some use of voice to show interest	- Crisp, clear voice, correct, precise pronunciation, all can understand. - proper volume; steady rate; enthusiasm; confidence	- Native like
Grammar & Vocabulary (Usage And Appropriateness For Audience)	- Frequent grammar or spelling errors - Inappropriate level for the audience, Misuse vocabulary	- Noticeable Errors - Often too simple or sophisticated, inconsistent. Some vocabulary incorrectly used	- Minor errors - Generally appropriate, little variation or creativity	- No errors, but simple language - Always appropriate for the audience. Excellent use of vocabulary	- No errors. Excellent use of grammar to support ideas - Creative use of language
Body Language, Gestures, Eye Contact (Turns back to audience and reads screen – 0)	- Dead person on stage - Almost no eye contact, reads notes/screen	- Excessive movement or many distracting gestures - Occasionally eye contact, mostly reads notes/screen	- Some distracting gestures, and some movement and useful gestures - Generally maintains eye contact frequently reads notes/screen	- No distracting gestures. Body language supports speech - Excellent eye contact, seldom uses notes	- Excellent use of body language - Constant eye contact, no use of notes
Organization: Intro, Main, Ending, Coherence (see RATING CHECKLIST)	- Difficult to follow as disorganized	- Generally follows outline, poor introduction or conclusion.	- Follows outline, material generally well organized. Some use of transitions and linkage of ideas. Conclusion acceptable	- Follows outline, material well organized. - Ideas clearly linked. Some use of transitions	- Excellent, clear linkage of ideas. - Good transitions Arouses interest in Introduction, and summarizes clearly main points in conclusion
Content: Relevant/ Interesting/ Accurate	- Several errors or lacks critical information	- Some errors and has irrelevant information	- Information is generally accurate, minor errors, generally meets needs of the audience	- Accurate information, related to needs of audience	- No errors, answers all needs of the audience
Visual Aids: Appropriate, Clear (Movies, sound – 0)	- Slides consist of full paragraphs of text, no or superfluous graphics - Tiny font	- Slides have full sentences and occasional superfluous graphics, Difficult to read	- Slides have short phrases, Graphics relate to text and presentation. Easily read	- Attractive, informative graphics, only key words, easily understood, Good use of masking	- Professional quality, Excellent use of visual, no unrelated graphics, easily read, supports presentation
Overall effectiveness	- Ineffective, alienated audience	- Little positive effect or exchange of info.. Audience bored	- Audience learned something, no change in attitude	- Audience generally positive and learned from presentation	- Audience was kept interested and would remember key points



ACADEMIC YEAR 2021 - 2022

DATE: _____

 Student name : _____ Student ID : _____
 Topic : _____

Wtg.	Criteria	Very poor	Poor	Average	Good	Excellent	Comments
15	Pronunciation & Voice Techniques (Pause, Volume, Speed Change, Stress, Tone, etc.)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
15	Language use: Grammar & Vocabulary (usage and appropriateness for audience)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
10	Body Language: Gestures, Eye contact, Facial expressions (turns back to the audience and reads from screen: 0 pt)	(1-2)	(3-4)	(5-6)	(7-8)	(9-10)	
20	Organization: Intro, Body, Ending, Coherence (see below)	(1-4)	(5-8)	(9-12)	(13-16)	(17-20)	
20	Content: Relevance, Accuracy	(1-4)	(5-8)	(9-12)	(13-16)	(17-20)	
10	Visual aids: Appropriateness, Clarity (Movies, sound: 0 pt)	(1-2)	(3-4)	(5-6)	(7-8)	(9-10)	
10	Overall effectiveness	(1-2)	(3-4)	(5-6)	(7-8)	(9-10)	
FINAL SCORE: /100							

Negative points: ⚡ Timing <3m: -1.5pts 3m - 3m29: -1.0pts 3m30 - 3m59: -.5pts 4m - 6m: OK >6m: -.5pts

Organization:

A. Introduction

- a. Greeting, name, position (Good morning ladies and gentlemen. My name is __, I'm a __)
- b. Purpose/ Objective (The purpose of this talk is to __)
- c. Connect with the audience (I can see that all of you love to __)
- d. Outline/ Main part (I've divided my presentation into __ parts)
- e. Questions (Should you have any questions, please save them until the end of my presentation)

B. Body (Transitions: Let's start with __/ That brings me to __/ Firstly, Secondly, Next, Lastly)

C. Ending

- a. Signaling the end (That brings me to the end of my presentation)
- b. Summary (Let me just run over the key points again)
- c. Closing (Thank you very much for your attention)
- d. Inviting questions (I'd be glad to answer any questions you might have)

Yes No

☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐

Examiner :

b. Final exam rubrics and marksheets

	Very Poor	Poor	Average	Good	Excellent
Pronunciation, Voice Techniques (Pauses, Volume, Speed Change, Stress, Tone, etc.) Grammar & Vocabulary (Usage and Appropriateness for Audience)	- Mumbles, often mispronounces, very difficult to understand. - Dead person talking, voice to text software does better	- Slurred speech mispronounces some words. Difficult to understand. - Quiet, monotone, sing/song, little or no expression, boring. - Noticeable Errors - Often too simple or sophisticated, inconsistent. - Some vocabulary incorrectly used	- Clear voice, few pronunciation errors. Some slurring. Most can understand the presentation - Some use of voice to show interest - Minor errors - Generally appropriate, little variation or creativity	- Crisp, clear voice, correct, precise pronunciation, all can understand. - Proper volume, steady rate, enthusiasm, confidence - No errors, but simple language - Always appropriate for the audience. Excellent use of vocabulary	- Native like - No errors. Excellent use of grammar to support ideas - Creative use of language
Body Language: Posture, Gestures, Eye contact, Facial expression (Turns back to audience and reads screen – 0) Organization: Intro, Main, Ending, Coherence (see RATING CHECKLIST) Content: Relevant/Accurate, Informative and Persuasive Visual Aids: Appropriateness, Clarity (Use of video clip exceeding 20 seconds – 0) Question response	- Dead person on stage - Almost no eye contact, reads notes/screen - Difficult to follow as disorganized - Several errors or lacks critical information - Slides consist of full paragraphs of text, no or superfluous graphics - Tiny font - Welcomes the question	- Excessive movement or many distracting gestures - Occasionally eye contact, mostly reads notes/screen - Generally follows outline, poor introduction or conclusion. - Some errors and has irrelevant information - Just focus on giving information - Slides have full sentences and occasional superfluous graphics, - Difficult to read - Listens carefully, doesn't interrupt	- Some distracting gestures, and some movement and useful gestures - Generally maintains eye contact frequently reads notes/screen - Follows outline, material generally well organized. Some use of transitions and linkage of ideas - Conclusion acceptable - Information is generally accurate, minor errors - Give reasons with little or no emphasis on persuasion - Slides have short phrases, Graphics relate to text and presentation. Easily read - Thinks before answering - Clarifies, rephrases as needed	- No distracting gestures. Body language supports speech - Excellent eye contact, seldom uses notes - Follows outline, material well organized. - Ideas clearly linked. Some use of transitions - Accurate information, related to needs of audience - Give frequent emphasis on persuasion - Attractive, informative graphics, only key words, easily understood, good use of masking - Answers correctly and briefly	- Excellent use of body language - Constant eye contact, no use of notes - Excellent, clear linkage of ideas. - Good transitions Arouses interest in Introduction, and summarizes clearly main points in conclusion - No errors, answers all needs of the audience - Persuade the audience well - Professional quality, Excellent use of visual, no unrelated graphics, easily read, supports presentation - Checks to see if questioner is satisfied



ACADEMIC YEAR 2021 - 2022

DATE: _____

Student name : _____ Student ID : _____

Topic : _____

Wtg.	Criteria	Very poor	Poor	Average	Good	Excellent	Comments
15	Pronunciation & Voice Techniques (Pause, Volume, Speed Change, Stress, Tone, etc.)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
10	Language use: Grammar & Vocabulary (usage and appropriateness for audience)	(1-2)	(3-4)	(5-6)	(7-8)	(9-10)	
15	Body Language: Posture, Gestures, Eye contact, Facial expression (turns back to the audience and reads from screen: 0 pt)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
15	Organization: Intro, Body, Ending, Coherence (see below)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
20	Content: Relevant, Accurate, Informative and Persuasive	(1-4)	(5-8)	(9-12)	(13-16)	(17-20)	
15	Visual aids: Appropriateness, Clarity (Movies, sound: 0 pt)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
10	Question response	(1-2)	(3-4)	(5-6)	(7-8)	(9-10)	
SCORE (max.100): _____		BCNUS (max.10): _____		TOTAL SCORE (max.100): _____			

Deduction points: ⇨ No references: -10 ⇨ Timing: <5m: -15pts 5m - 5m29: -10pts 5m30 - 5m59: -5pts > 8m: -5pts

Bonus points: Up to 10pts for creativity, which involves PowerPoint design, Organization of information, Presentation style ...

Organization:

A. Introduction

- a. Greeting name, position (Good morning, ladies and gentlemen. My name is ___. I'm a ___) ☐ Yes ☐ No
- b. Connect with the audience (I can see that all of you love to ___) ☐ Yes ☐ No
- c. Purpose/ Objective (The purpose of this talk is to ___) ☐ Yes ☐ No
- d. Time length (My presentation should last for ___) ☐ Yes ☐ No
- e. Outline/ Main part (I've divided my presentation into ___ parts) ☐ Yes ☐ No
- f. Questions (Should you have any questions, please save them until the end of my presentation) ☐ Yes ☐ No

B. Body (Transitions: Let's start with ___/ That brings me to ___/ Firstly, Secondly, Next, Lastly) ☐ Yes ☐ No

C. Ending

- a. Signaling the end (That brings me to the end of my presentation) ☐ Yes ☐ No
- b. Summary (Let me just run over the key points again) ☐ Yes ☐ No
- c. Closing (Thank you very much for your attention) ☐ Yes ☐ No
- d. Inviting questions (I'd be glad to answer any questions you might have) ☐ Yes ☐ No

Examiner : _____

Date revised: May, 2023

School of Languages



COURSE SYLLABUS

Course Name: Calculus 1

Course Code: MA001IU

1. General information

Course designation	This course equips students with basic concepts of calculus: limits, continuity, differentiation, and integration. Applications of these concepts are extensively discussed.				
Semester(s) in which the course is taught	1, 2				
Person responsible for the course	<i>Nguyen Dinh</i>				
Language	English				
Relation to curriculum	Compulsory				
Teaching methods	Lectures, assignments				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	4		
	Contact hours	50	50	0	
	Self-Study hours	120	120	0	
	Total workload	170	170	0	
Credit points	4 credits (6.16 ECTS)				
Required and recommended prerequisites for joining the course	None				
Course objectives	1. To provide students with the main ideas and techniques of calculus. These include limits, continuity, differentiation, and integration.				

	2. To introduce practical applications of these ideas and techniques, through practical examples taken from many areas of engineering, business, and life sciences. 3. To develop skills in mathematical modeling and problem solving, ability to think logically, and adapt these skills creatively to new situations		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Have basic knowledge of limits and derivatives (Program outcomes: a) CLO2. Have basic knowledge of definite/indefinite integrals (Program outcomes: a)	
	Skill	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)	
	Attitude	CLO5. Confident when dealing with derivatives and integrals. Comfortable with using derivatives and integrals in practical situations. (Program outcome: j, k)	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	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 Limits.	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'Hôpital's Rules, Maxima and Minima Problems, Newton's Method	1	T, U
	Antiderivatives 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, <i>Calculus</i> , Thomson Learning, 7 th edition, 2012.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILOs							
	1	2	3	4	5	6	7	8
1	L							
2	L							
3		M						
4		M						
5				M				

3. Planned learning activities and teaching methods

Week	Topics	CLO	Assessment	Teaching and Learning activities
1	Functions and Graphs, Inverse Functions, Exponential and Logarithmic Functions	1,3		Lecture
2	Parametric Curves, Limit. One-sided Limits, L'Hôpital's Rule, 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'Hôpital's Rules, Maxima and Minima Problems, Newton's Method	2, 4	Quiz	Lectures and Quiz

11	Antiderivatives 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,	Exercises	
Final Exam		1, 2, 3,		

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%)	Q1, Q2 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 60% of students having scores greater than 60 out of 100.

5. Date revised: May, 2023



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

COURSE SYLLABUS

Course Name: Physics 1 (General Mechanics)

Course Code: **PH013IU**

1. General information

Course designation	<i>This subject will provide an introduction to mechanics including: concepts and principles of kinetics, dynamics, energetics of motion of a particle and a rigid body.</i>				
Semester(s) in which the course is taught	1, 2				
Person responsible for the course	Assoc. Prof. Phan Bảo Ngọc Dr. Phan Hiền Vũ				
Language	English				
Relation to curriculum	Compulsory				
Teaching methods	Lecture, lesson, assignment.				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	2		
	Contact hours	25	25	0	
	Self-Study hours	60	60	0	
	Total workload	85	85	0	
Credit points	2 credits (3.08 ECTS)				
Required and recommended prerequisites for joining the course	None				
Course objectives	This course will provide students with: 1. The basic knowledge of general Mechanics Physics 2. Skills to solve problems in engineering environment by applying both theoretical and experimental techniques				

	3. Understanding and skills needed to use physical laws governing real process and to solve them in the engineering environment 4. Confidence and fluency in discussing physics in English.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. An ability to understand basic knowledge of law of conservations and dynamics of rigid body. CLO2. An ability to analysis and design a problem in science and engineering	
	Skill	CLO3. An ability in applying knowledge of physics	
	Attitude	CLO4. An ability to communicate effectively in writing manner	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (2 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Chapter 1: Bases of Kinematics	2	I, T
	Chapter 2: The Law of Motion	2	I, T
	Chapter 3: Work and Mechanical Energy	3	I, T
	Chapter 4: Linear Momentum and Collisions	2	I, T
	Chapter 5: Rotation of a Rigid Object About a Fixed Axis	2	I, T
	Chapter 6: Equilibrium and Elasticity	2	I, T
Chapter 7: Universal Gravitation	2	I, T	
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] Halliday D., Resnick R. and Walker, J. (2011) <i>Fundamentals of Physics</i> , 9 th edition, John Willey and Sons, Inc.		

	[2] Alonso M. and Finn E.J. (1992) <i>Physics</i>, Addison-Wesley Publishing Company. [3] Hecht, E. (2000) <i>Physics: Calculus</i>, 2nd edition, Brooks/Cole. [4] Faughn/Serway (2006) <i>Serway's College Physics</i>, Thomson Brooks/Cole.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CLO	1	2	3	4	5	6	7	8
1	L							
2		M						
3		M						
4								L

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1-2	Chapter 1: Bases of Kinematics	1	Quiz1	Lecture, Discussion, In Class-Quiz	[1].0. [2].1.
3-4	Chapter 2: The Law of Motion	1	HW1	Lecture, Inclass, HW	[1].9.
5-6-7	Chapter 3: Work and Mechanical Energy	3	Quiz2	Lecture, Discussion, In Class-Quiz	[2].2.
8-9	Chapter 4: Linear Momentum and Collisions	2	HW2, Quiz3	Lecture, Group work, HW	[1]. 2, 4 [2]. 2
10	Midterm				
11-12	Chapter 5: Rotation of a Rigid Object About a Fixed Axis	3	HW3	Lecture, Group work, HW	[2]. 4. [1]. 18.
13-14	Chapter 6: Equilibrium and Elasticity	3		Lecture, Group work	[3]. 10
15-16	Chapter 7: Universal Gravitation	3	HW4	Lecture, Discussion, HW	[2]. 8
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Attendance + Homework + in-class discussion (15%)				
Quizzes (Qz) / assignment (As) (15%)	Qz1, Qz3/ As.P1 50%Pass	Qz2, Qz4/ As.P2 50%Pass	Qz1, Qz2, Qz3, Qz4 / As.P3 50%Pass	Qz1, Qz2, Qz3, Qz4 / As.P4 50%Pass
Midterm exam (30%)	Q1, Q2, Q3 50%Pass	Q4, Q5 50%Pass	Q3, Q5 50%Pass	Q3, Q5 50%Pass
Final exam (40%)	Q1, Q2, Q3 50%Pass	Q4, Q5 50%Pass	Q3, Q5 50%Pass	Q3, Q5 50%Pass

Note: %Pass: Target that 60% of students having scores greater than 60 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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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 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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.

Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May, 2023



COURSE SYLLABUS

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

Course Code: PH014IU

1. General information

Course designation	<i>This subject will provide a basic knowledge of fluid mechanics; macroscopic description of gases; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gasses and the kinetic theory of gases.</i>					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	Assoc. Prof. Phan Bảo Ngọc Dr. Phan Hiền Vũ					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, lesson, assignment.					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	2			
	Contact hours	25	25	0		
	Self-Study hours	60	60	0		
	Total workload	85	85	0		
Credit points	2 credits (3.08 ECTS)					
Required and recommended prerequisites for joining the course	None					
Course objectives	This course will provide students with: 1. The basic knowledge of Fluid Mechanics and Thermal Physics 2. Skills to solve problems in engineering environment by applying both theoretical and experimental techniques					

	3. Understanding and skills needed to use physical laws governing real process and to solve them in the engineering environment 4. Confidence and fluency in discussing physics in English.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. An ability to understand basic knowledge of the kinetic energy of ideal gas and the second law of thermodynamics. CLO2. An ability to analysis and design a problem in science and engineering	
	Skill	CLO3. An ability in applying knowledge of physics	
	Attitude	CLO4. An ability to communicate effectively in writing manner	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (2 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Chapter 1: Fluid Mechanics	2	I, T
	Chapter 2: Temperature, Heat, and the First Law of Thermodynamics	4	I, T
	Chapter 3: The Kinetic Theory of Gases	5	I, T
	Chapter 4: Entropy and the Second Law of Thermodynamics	4	I, T
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] Halliday D., Resnick R. and Walker, J. (2011) <i>Fundamentals of Physics</i>, 9th edition, John Willey and Sons, Inc. [2] Alonso M. and Finn E.J. (1992) <i>Physics</i>, Addison-Wesley Publishing Company. [3] Hecht, E. (2000) <i>Physics: Calculus</i>, 2nd edition, Brooks/Cole. [4] Faughn/Serway (2006) <i>Serway's College Physics</i>, Thomson Brooks/Cole.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CLO	1	2	3	4	5	6	7	8
1	L							
2		M						
3		M						
4								L

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1-2	Chapter 1: Fluid Mechanics	1, 2	Quiz1	Lecture, Discussion, In Class-Quiz	[1].0. [2].1.
3-6	Chapter 2: Temperature, Heat, and the First Law of Thermodynamics	1, 2	HW1	Lecture, Inclass, HW	[1].9.
7-9	Chapter 3: The Kinetic Theory of Gases (part 1)	3, 4	Quiz2	Lecture, Group work	[2].2.
10	Midterm				
11-12	Chapter 3: The Kinetic Theory of Gases (part 2)	3, 4	Quiz3, HW2	Lecture, Group work, HW	[2]. 4. [1]. 18.
13-16	Chapter 4: Entropy and the Second Law of Thermodynamics	3, 4	HW3, HW4	Lecture, Group work	[3]. 10
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Attendance + Homework + in-class discussion (15%)				

Quizzes (Qz) / assignment (As) (15%)	Qz1, Qz3/ As.P1 50%Pass	Qz2, Qz4/ As.P2 50%Pass	Qz1, Qz2, Qz3, Qz4 / As.P3 50%Pass	Qz1, Qz2, Qz3, Qz4 / As.P4 50%Pass
Midterm exam (30%)	Q1, Q2, Q3 50%Pass	Q4, Q5 50%Pass	Q3, Q5 50%Pass	Q3, Q5 50%Pass
Final exam (40%)	Q1, Q2, Q3 50%Pass	Q4, Q5 50%Pass	Q3, Q5 50%Pass	Q3, Q5 50%Pass

Note: %Pass: Target that 60% of students having scores greater than 60 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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.

2	Demonstrates little understanding of the problem. Many requirements of the 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 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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's own and others' assumptions and carefully evaluates	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

	the relevance of contexts when presenting a position.		be more aware of others' assumptions than one's own (or vice versa).	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant

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

Source: Association of American Colleges and Universities

6. Date revised: May, 2023

Department of Physics



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology

COURSE SYLLABUS

Course Name: Chemistry for Engineers

Course Code: **BT362IU**

1. General information

Course designation	This one-semester course is designed for engineering students those who are pursuing a chemistry or non-chemistry engineering degree such as information technology, bio-technology, civil, biomedical, electronic and telecommunication engineering, environmental engineering, and chemical engineering. The course will introduce the basic principles of chemistry and connect those principles to issues in engineering professions.						
Teaching schedule	☒ Year 1 ☐ Year 2 ☐ Year 3 ☐ Year 4 ☐ Year 5 ☒ Semester 1 ☐ Semester 2 ☐ Summer						
Person In-Charge	Assoc.Prof. Pham Thi Hoa Assoc.Prof. Nguyen Tan Khoi						
Language	English						
Relation to curriculum	☒ General ☐ Fundamental ☐ Specialization ☐ Project/Internship/Thesis				☐ Compulsory ☐ Elective		
Teaching methods	☒ Lecture ☐ Lesson ☐ Project ☐ Seminar Others, please specify:						
Workload			Lecture	Lab	Project	Internship	Thesis
		<i>Credit</i>	3				
	Contact hours	37.5	37.5	0	0	0	0
	Self-Study hours	90	90	0	0	0	0
	Total workload	127.5	127.5	0	0	0	0
Credit points	3 credits (4.62 ECTS)						
Requirements for taking the course	☒ None ☐ Prerequisite course: <i>(Please specify course ID & course title, if any)</i> ☐ Parallel course: <i>(Please specify course ID & course title, if any)</i> ☐ Previous course: <i>(Please specify course ID & course title, if any)</i>						
Course objectives							

Course learning outcomes	Upon the successful completion of this course, students will be able to:			
	Competency level	Course learning outcome (CLO)		
	Knowledge	CLO1. Demonstrate an understanding of the basic principles of chemistry, including atomic structure, chemical bonding, and the periodic table. CLO2. Apply fundamental chemical concepts, such as stoichiometry, kinetics, and thermodynamics, to solve problems and make predictions about chemical reactions. CLO3. Identify common chemical compounds, including organic and inorganic molecules, acids and bases, and salts. CLO4. Analyze chemical reactions using principles of equilibrium, acid-base reactions, and oxidation-reduction reactions. CLO5. Apply chemistry knowledge to interdisciplinary fields, such as biochemistry, environmental science, materials science, and engineering.		
	Skill			
	Attitude			
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (2.5 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)			
	No.	Topic	Weight	Level
	1	Chemistry and Measurement	1	I, T
	2	Atoms, Molecules and Ions	2	T, U
	3	Periodicity	1	T, U
	4	Chemical Bonds	2	T
	5	Intermolecular Forces	2	T, U
	6	Gases and Their Properties	2	T
	7	Solutions and Their Properties	1	T, U
	8	Solids and Their Properties	1	T, U
	9	Chemical Reactions	2	I, T
	10	Chemical Kinetics	2	I, T
	11	Chemical Equilibrium	1	T, U
	12	Electrolytes, Acid- Base, pH and Buffer	1	I, T
	13	Thermochemistry	2	I, T
	14	Thermodynamics	2	I, T
Examination forms	☒ Multiple-choice questions ☐ Oral examination ☐ Report ☒ Written examination ☐ Presentation ☐ Others, please specify: ☐ Assignments			
Other 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	I. Textbooks Mary Jane Shultz (2010). Chemistry for Engineers – An Applied Approach. Houghton Mifflin. Darrell Ebbing and Steven D. Gammon (2010). General Chemistry 9th Ed., Brooks/Cole, USA. Nivaldo J. Tro (2008). Chemistry: A Molecular Approach, 2nd Ed., Pearson. Masterton and Hurley (2009). Chemistry, Principles and Reactions, 6th Ed., Cengage learning, USA. II. References

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

CLO	ILO (*)							8
	1	2	3	4	5	6	7	
1	L							
2	L							
3			L					
4			M					
5					M		M	

3. Planned learning activities and teaching methods

No.	Week	Topic	CLO	Assessments	Learning activities	Resources
1.	1	Chemistry and Measurement	1,5	HW	Lecture	
2.	2	Atoms, Molecules and Ions	1	HW	Lecture	
3.	3	Periodicity	1	HW	Lecture	
4.	4&5	Chemical Bonds	1	HW	Lecture	
5.	6	Intermolecular Forces	1	HW	Lecture	
6.	7	Gases and Their Properties	1	HW	Lecture	
7.	8	Solutions and Their Properties	1	HW	Lecture	
8.	9-10	Midterm				
9.	11	Solids and Their Properties	1,5	HW	Lecture	

No.	Week	Topic	CLO	Assessments	Learning activities	Resources
10.	12	Chemical Reactions	1,4	HW	Lecture	
11.	13	Chemical Kinetics	2,5	HW	Lecture	
12.	14	Chemical Equilibrium	4	HW	Lecture	
13.	15	Electrolytes, Acid-Base, pH and Buffer	3,4,5	HW	Lecture	
14.	16	Thermochemistry	2,5	HW	Lecture	
15.	17	Thermodynamics	2,5	HW	Lecture	
16.	18	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Homework/Quiz (30%)	50%pass		50%pass		
Midterm exam (30%)	50%pass			50%pass	
Final exam (40%)		50%pass			

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

5. **Rubrics (optional): No**

6. **Revision Date: May, 2023**

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

Required and recommended prerequisites for joining the course	None								
Course objectives	The principal objective of this course is for students to develop a fundamental understanding of the key concepts, principles, and theories of modern biology. This objective will provide the foundation necessary for subsequent courses in the biological sciences. how natural selection ultimately underpins all biological processes and how evolution has generated biological diversity.								
Course learning outcomes	Upon the successful completion of this course students will be able to: <table> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> <tr> <td>Knowledge</td><td>CLO1. Understanding of foundation in basic biological principles, theories of modern biology and interactions between organisms and their environments. CLO2. To develop the ideas of the uniqueness and diversity of life and the interrelationships among living organisms.</td></tr> <tr> <td>Skill</td><td>CLO3. Applying elementary mathematics, chemistry to biology. Acquire skills in formulating hypotheses, designing, and conducting simple experiments to test them.</td></tr> <tr> <td>Attitude</td><td>CLO4. To develop a working knowledge of study which is necessary for a proper understanding of biological concepts and record evidence of their verbal, written and graphic communication skills.</td></tr> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1. Understanding of foundation in basic biological principles, theories of modern biology and interactions between organisms and their environments. CLO2. To develop the ideas of the uniqueness and diversity of life and the interrelationships among living organisms.	Skill	CLO3. Applying elementary mathematics, chemistry to biology. Acquire skills in formulating hypotheses, designing, and conducting simple experiments to test them.	Attitude	CLO4. To develop a working knowledge of study which is necessary for a proper understanding of biological concepts and record evidence of their verbal, written and graphic communication skills.
Competency level	Course learning outcome (CLO)								
Knowledge	CLO1. Understanding of foundation in basic biological principles, theories of modern biology and interactions between organisms and their environments. CLO2. To develop the ideas of the uniqueness and diversity of life and the interrelationships among living organisms.								
Skill	CLO3. Applying elementary mathematics, chemistry to biology. Acquire skills in formulating hypotheses, designing, and conducting simple experiments to test them.								
Attitude	CLO4. To develop a working knowledge of study which is necessary for a proper understanding of biological concepts and record evidence of their verbal, written and graphic communication skills.								

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> 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 Biology and Course outline</td><td>1</td><td>I, T</td></tr><tr><td>The chemistry of Life-The Chemical Context of Life</td><td>1</td><td>I, T</td></tr><tr><td>A Tour of the Cell- Membrane Structure and Function- Cellular Energy- Cell Communication</td><td>2</td><td>I, T</td></tr><tr><td>Cell Cycle-Genetic Basis of Life- Regulation of Gene expression</td><td>2.5</td><td>I, T</td></tr><tr><td>Gene Activity and Biotechnology</td><td>1.5</td><td>T, U</td></tr><tr><td>The Evolutionary History of Biological Diversity, The Evolution of Populations; The Origin of Species</td><td>2</td><td>I, T</td></tr><tr><td>Animal Form and Function- Basic principles- Endocrine system; Reproduction and Development; Nervous system; Sensory & motor mechanisms.</td><td>2</td><td>T, U</td></tr><tr><td>Structure and Function of Plants: Structure, Reproduction and Development</td><td>1</td><td>T, U</td></tr><tr><td>Ecology: Interactions between organisms and the environment</td><td>1</td><td>T, U</td></tr><tr><td>Summary-Review</td><td>1</td><td>T, U</td></tr></table>	Topic	Weight	Level	Introduction to Biology and Course outline	1	I, T	The chemistry of Life-The Chemical Context of Life	1	I, T	A Tour of the Cell- Membrane Structure and Function- Cellular Energy- Cell Communication	2	I, T	Cell Cycle-Genetic Basis of Life- Regulation of Gene expression	2.5	I, T	Gene Activity and Biotechnology	1.5	T, U	The Evolutionary History of Biological Diversity, The Evolution of Populations; The Origin of Species	2	I, T	Animal Form and Function- Basic principles- Endocrine system; Reproduction and Development; Nervous system; Sensory & motor mechanisms.	2	T, U	Structure and Function of Plants: Structure, Reproduction and Development	1	T, U	Ecology: Interactions between organisms and the environment	1	T, U	Summary-Review	1	T, U
Topic	Weight	Level																																
Introduction to Biology and Course outline	1	I, T																																
The chemistry of Life-The Chemical Context of Life	1	I, T																																
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Summary-Review	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	Textbook: [1] Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V., Jackson, R.B., 2014. Campbell Biology. 10 th Edition, Benjamin Cummings. Book Reference: [2] Gilbert, S.F., Barresi, M.J. F., 2016. Developmental Biology, 11th Edition. Sinauer Associates, Inc. MA Gilbert, S.F., Barresi, M.J. F., 2016. Developmental Biology, 11th Edition. Sinauer Associates, Inc. MA. Article References: [3] To be provided (Note: Articles will be updated every year)																																	

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CLO	1	2	3	4	5	6	7	8
1	L							
2		L						
3			M					
4					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Biology- Course outline	1	Quizzes	Lecture, Discussion, In Class-Quiz	1, 2, 3
2	The chemistry of Life-The Chemical Context of Life	1		Lecture, Discussion, In Class-Quiz	1, 2
3	A Tour of the Cell-Membrane Structure and Function.	1		Lecture, Presentation	1, 2
4	Cellular Energy-Cellular Respiration Photosynthesis-Cell Communication	1	HW1	Lecture, Presentation	1, 2
5	The Cell Cycle- Genetic Basis of Life Mendel and the Gene Idea.	1, 2		Lecture, Presentation	1, 2
6	The Molecular Basis of Inheritance- From Gene to Protein-Regulation of Gene Expression.	1, 2	HW2	Lecture, Presentation	1, 3
7	Meiosis-Gamete and Sexual Life Cycles	1, 3		Lecture, Presentation	1, 2, 3
8	Gene Activity and Biotechnology	1, 4		Lecture, Discussion, In Class-Quiz	1, 3
9-10	Midterm				
11	Introduction to Evolution of Biodiversity: A Darwinian View of Life-The Evolution of Populations-The Origin of Species	1, 2		Lecture, Discussion, In Class-Quiz	1
12	The Evolutionary History of Biological Diversity-Phylogeny and the Tree of Life.	1, 2		Lecture, Discussion, Presentation	1
13	Basic principles of animal form	3, 4	HW3	Lecture	1, 2, 3

Week	Topic	CLO	Assessments	Learning activities	Resources
	and function-Animal Nutrition- Circulation-Immune system- Osmoregulation.			Discussion Presentation	
14	Hormones and the endocrine system- Reproduction and development Nervous system- Sensory and motor mechanisms.	3, 4		Lecture, Discussion, Presentation	1, 2, 3
15	Plant Structure, Reproduction and Development-Transport in Vascular Plants-Plant Nutrition- Plant Responses to Signals.	3, 4	HW4	Lecture, Discussion, Presentation	1
16	Ecology: Interactions between organisms and the environment limit the distribution of species.	2, 4		Lecture, Discussion, Presentation	1
17	Summary-Revision			Review-Test	
18-19	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class Presentation/ quizzes (15%)			Presentation/ 70%Pass	Quiz/ Part. 70%Pass
Homework exercises (15%)	HW1 70%Pass	HW2 70%Pass	HW3 70%Pass	HW4 70%Pass
Midterm exam (30%)	Part I. 50% Pass		Part II. Q1,2 50% Pass	Part II. Q3,4 50% Pass
Final exam (40%)		Part I. 50% Pass	Part II. Q1,2 50% Pass	Part II. Q3,4 50% Pass

Note: %Pass (Exam): % students have scores greater than 50 out of 100.

%Pass (Presentation/ Assignment): % students have scores greater than 70 out of 100.

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Practice in Biology

Course Code: BT312IU

1. General information

Course designation	<i>This course demonstrates the basic practice works with biological samples and reactions. Students will be introduced with sample preparation, observation, and analysis.</i>					
Semester(s) in which the course is taught	1					
Person responsible for the course	Tong Thi Hang, MSc Nguyen Hoang Minh, MSc					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, lesson, lab work, project.					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		Credit		1		
Contact hours	25		0	25		
Self-Study hours	30		0	30		
Total workload	55		0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	Enroll Biology course					
Course objectives	Students will be instructed with the common works in biotechnology including observation of plant and animal cells, observation of cellular change in different osmosis, detection of main compositions of the cells, enzyme reactions, photosynthesis, water evaporation, and cell division. Through this unit, students will become acquainted with the basic					

	techniques in biology and gain an appreciation of the foundational skills necessary to apply biology in different fields of applied sciences.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Describe the cell structures, differences between plant and animal cells; events occur in photosynthesis and transpiration; enzyme characteristics; and events during cell cycles. CLO2. Explain the interaction of cells and biological substances with the specific chemicals indicator and how we can recognize them.	
	Skill	CLO3. Analyze and evaluate the cellular change in difference osmosis conditions, activity of enzyme, the process of photosynthesis and water evaporation in different conditions of practice.	
	Attitude	CLO4. Understand the reasons around safety and privacy when using sample, tissue, and organism handling, conduct and apply ethical practices.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (5 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Cell observation. Osmosis	1	T, U
	Organic compositions in the cells	1	T, U
	Photosynthesis. Transpiration.	1	T, U
Examination forms	Multiple-choice questions, short-answer questions, problem-solving questions, report, experiment performance, interview.		
	Attendance: Attendance is compulsory for all class sessions. Students will be assessed based on their class participation and lab work performance. Questions and comments are strongly encouraged.		
	Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	[1] S. Burran, D. Desrochers, 2015. Principles of Biology I Lab Manual, University system of Georgia		

	[2] D. S. Vodopich, R. Moore, 2017. Biology Laboratory manual, 7 th edition, McGrawHill Education.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILOs							
	1	2	3	4	5	6	7	8
1	L							
2	L							
3		L						
4					L			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Cell observation. Osmosis	1,2,3, 4	Prelab, Lab work, report1	Discussion, Instruction, lab work	[1], [2]
2	Organic compositions in the cells	2,3	Prelab, Lab work, report2	Discussion, Instruction, lab work	[1], [2]
3	Photosynthesis. Transpiration.	2, 3	Prelab, Lab work, report3	Discussion, Instruction, lab work	[1], [2]
4	Enzyme reactions	2, 3	Prelab, Lab work, report4	Discussion, Instruction, lab work	[1], [2]
5	Cell reproduction – mitosis and meiosis	1, 3, 4	Prelab, Lab work, report5	Discussion, Instruction, lab work	[1], [2]
6	Final exam		Exam		

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4

Prelab (30%)	Prelab 1-5 Pass 70%	Prelab 1-5 Pass 70%		
Report (40%)			Report 1-5 60%Pass	Report 1-5 60%Pass
Final exam (30%)	Question 1-5 60 %Pass	Question 6-10 60%Pass	Question 11-15 60%Pass	Question 16-20 60%Pass

Note: %Pass: Target that 60 % of students having scores greater than 60 out of 100.

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

	will be provided with the ability of analyzing, predicting and explaining inorganic complexes.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understanding of chemical elements and compounds based on their general trends, structures, properties, and reactions, as well as being able to relate the knowledge with compounds and processes in living materials. CLO2. Recognizing different type of symmetrical elements of molecular structure	
	Skill	CLO3. Know how to draw and predict the structures of simple compounds.	
	Apply	CLO4. Able to predict and explain properties of transition metal complexes using crystal field theory. CLO5. Able to present, explain and communicate important transition metal complexes.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Foundations of inorganic chemistry Molecular structure and bonding	1	T, I
	Intermolecular forces	1	T, U
	Molecular geometry	2	T, U
	Periodic trends of the elements Atomic parameters Periodic characteristics of compounds	1	T, I
	Coordination chemistry	2	T, U
	The elements and their compounds Types of inorganic reactions	1	T, I
	Main Group Elements	1	T, U
	Transition elements	3	T, U

	Group presentation: Transition metals complexes and their application in daily activity and biochemistry	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 based on their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	[1] Shriver and Atkins' Inorganic Chemistry, 5th Edition, 2009, Peter Atkins, Tina Overton, Jonathan Rourke, Mark Weller and Fraser Armstrong. [2] Inorganic Chemistry, 5th Edition, 2014, Gary Miessler, Paul Fischer and Donald Tarr. [3] Biological Inorganic Chemistry An Introduction, 1st Edition, 2008, Robert Crichton.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-5) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	L		L					
2			L					
3			M					
4			M					
5								M

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	<i>Lecture 1: Part 1: Foundations of inorganic chemistry Molecular structure and bonding</i>	1	Quiz1, HW1	Lecture, In Class-Quiz, HW	
2	<i>Lecture 2: Intermolecular forces</i>	1	Quiz2, HW2	Lecture, In Class-Quiz, HW	
3-4	<i>Lecture 3: Molecular geometry</i>	2	Quiz3, HW3	Lecture, In Class-Quiz, HW	

5	<i>Lecture 4: Periodic trends of the elements</i> <i>Atomic parameters</i> <i>Periodic characteristics of compounds</i>	1	Quiz4, HW4	Lecture, In Class- Quiz, HW	
6-7	<i>Lecture 5-6: Coordination chemistry</i>	1,3	Quiz5, HW5	Lecture, In Class- Quiz, HW	
8	<i>Lecture 7: Part 2: The elements and their compounds</i> <i>Types of inorganic reactions</i>	1	Quiz6, HW6	Lecture, In Class- Quiz, HW	
	Midterm				
9	<i>Lecture 7: Main Group Elements</i>	1	Quiz7, HW5	Lecture, In Class- Quiz, HW	
10-12	<i>Lecture 8: Transition elements</i>	4	Quiz8, HW6	Lecture, In Class- Quiz, HW	
13-15	<i>Group presentation: Transition metals complexes and their application in daily activity and biochemistry</i>	4,5	Quiz9	Lecture, In Class- Quiz, HW	
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
In-class exercises/quizzes (15%)	80% Pass	80% Pass	80% Pass	80% Pass	80% Pass
Homework exercises (10%)	90% Pass	90% Pass	90% Pass	90% Pass	
Midterm exam (35%)	70% Pass	70% Pass	70% Pass	70% 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)

6. Grading checklist

a. Holistic rubric

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

b. Analytic rubric

7. Date revised: March 12, 2022

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology

A handwritten signature in blue ink, appearing to read 'N. Van Thuan', is written over a horizontal line.

Assoc.Prof., Dr. Nguyễn Văn Thuận

Course Name: Inorganic Chemistry Lab

1. General information

Course designation	The inorganic chemistry laboratory course introduces the student to fundamental techniques and procedures in preparing solutions, limit test, synthesis and characterization of inorganic compounds and simple reactions used in the inorganic chemistry laboratory. In addition, the student will be trained in the proper way to write a scientific laboratory report.						
Semester(s) in which the course is taught	1,2						
Person responsible for the course	Dr. Le Quang Phong						
Language	English						
Relation to curriculum	Fundamental						
Teaching methods	lecture, lab work.						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>		1			
	Contact hours	25	0	25			
	Self-Study hours	30	0	30			
	Total workload	55	0	55			
Credit points	1 credit (2.00 ECTS)						
Required and recommended prerequisites for joining the course	Prerequisite course: Chemistry for Engineers Parallel course: Inorganic Chemistry						

Course objectives	The inorganic chemistry laboratory provides students strong foundation techniques in solution preparation, synthesis of drugs and other inorganic compounds from inorganic chemicals The course also emphasizes testing for limitation of inorganic chemicals in drugs and daily products.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand starting materials structures, functional groups, mechanism, and typical reaction conditions. Test prepared substances by physical/reaction/spectroscopic means.	
	Skill	CLO3. Able to perform laboratory techniques and fundamental types of reactions, to analyze, predict, and explain many aspects of everyday life using laboratory skills.	
	Attitude	CLO2. Adhere to safely handling of chemical, glassware, equipment, preparing solutions, performing reactions.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (4 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Preparation of Laboratory Solutions	1	I, T
	Synthesis of Copper (I) Chloride	1	I, T
	Synthesis of Sodium Thiosulfate Pentahydrate	1	I, T
	Synthesis of Cis-Platin	1	I, T
	Limit Test for Chloride and Sulfates	1	T,U
Examination forms	Multiple-choice questions, short-answer questions		
Study and examination requirements	Students are expected to spend at least 8 hours per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that if students attend less than 80% of scheduled classes, they may be refused final assessment. Regular attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted. The Inorganic Chemistry Lab requires full attendance in order to pass the course.		

Reading list	[1] “Shriver and Atkins Inorganic Chemistry” by Peter Atkins, Tina Overton, Jonathan Rourke, Mark Weller and Fraser Armstrong , (5th Edition, 2009). [2] “Inorganic Chemistry” by Paul J. Fischer, Gary L. Miessler and Donald A. Tarr, Inorganic Chemistry (Pearson, 2013) [3] Department of Applied Chemistry – Inorganic Chemistry Lab Manual.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-3) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2				M				
3					L			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Preparation of Laboratory Solutions	1,2	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3]
2	Synthesis of Copper (I) Chloride	1,2	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3]
3	Synthesis of Sodium Thiosulfate Pentahydrate	1,2	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3]
4	Synthesis of Cis-Platin	1,2	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3]
5	Limit Test for Chloride and Sulfates	1,2,3	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3]
6	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class Quizzes (10%)	60%Pass	60%Pass	60%Pass
Lab Reports (40%)	80%Pass	80%Pass	80%Pass
Final Exam (50%)	90%Pass	90%Pass	90%Pass

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

5. Rubrics (optional)

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	5		
Introduction demonstrates thorough knowledge of relevant background and prior work	5		
Summary of methods and experiment procedures	5		
Results contain enough information of experiments	20		
Analysis and discussion demonstrate good subject mastery	20		
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, citation and syntax	10		
Clear lab notes and easy to read	10		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.

Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May 24th, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Organic Chemistry 1

Course Code: **BTBC201IU**

1. General information

Course designation	<i>This course is specifically designed for students of Biochemistry. It is the first part of a 2-semester course in Organic Chemistry. This particular module provides fundamental information on aspects of stereochemistry and the basics of addition, substitution and elimination reactions, functional groups, saturated and aromatic heterocyclic compounds.</i>					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	Dr. Le Quang Phong					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, lesson, homework, quiz.					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	Chemistry for Engineers					
Course objectives	Students will be provided with skills of recognizing different types of functional groups and reactions. Students will be provided with the ability to analyze and draw reaction mechanisms.					

Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand organic and hydrocarbon compound structures, their properties, and reactions	
	Skill	CLO2. Know how to distinguish chiral and achiral compounds and draw CLO3. Know how to draw a reaction mechanism.	
	Apply	CLO4. Able to predict products of hydrocarbons, alkyl halide and aromatic compounds reactions. CLO5. Able to characterize and determine the organic compounds structures.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Bonding and molecular structure	2	T, I
	Introduction to organic compounds	1	T, I
	Stereochemistry	1	T, U
	Types of organic reactions	1	T, I
	Alkanes and Cycloalkanes	1	T, U
	Alkenes	2	T, U
	Alkynes	1	T, U
	Alkyl halides	3	T, U
	Diels and Aromatic compounds	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 based on their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	[1] Organic Chemistry, 7th Edition, 2007, John McMurry [2] Organic Chemistry with a Biological Emphasis, LibreTexts Open Access, 2016, Timothy Soderberg		

	[3] Organic Chemistry, 12th Edition, 2016, T.W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder [4] Organic Chemistry, 8th Edition, 2013, L.G. Wade Jr.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-4) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILO							
	1	2	3	4	5	6	7	8
1			L					
2			M					
3			M					
4		H						
5			L					

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1-2	<i>Lecture 1: Bonding and molecular structure: Lewis structure, Electronegativity and polarity; Resonances; Intermolecular forces (review) Hybridization, Writing organic structures and mechanisms. Curved arrows</i>	1	Quiz1, HW1	Lecture, In Class-Quiz, HW	
3	<i>Lecture 2: Introduction to organic compounds: Hydrocarbons and functional groups Infrared Spectroscopy: Introduction</i>	1, 5	Quiz2, HW2	Lecture, In Class-Quiz, HW	
4	<i>Lecture 3: Stereochemistry</i>	2	Quiz3, HW3	Lecture, In Class-Quiz, HW	
5	<i>Lecture 4: Types of organic reactions</i>	1,3	Quiz4, HW4	Lecture, In Class-Quiz, HW	
6	<i>Lecture 5: Alkanes and Cycloalkanes: Nomenclature and Conformations</i>	1,3,4	Quiz5, HW5	Lecture, In Class-Quiz, HW	
7-8	<i>Lecture 6: Alkenes: Properties and Synthesis; <u>Addition reactions</u> Review</i>	1,3,4	Quiz6, HW6	Lecture, In Class-	

				Quiz, HW	
	Midterm				
9	<i>Lecture 7: Alkynes: Properties and Synthesis; Addition reactions</i>	1,3,4	Quiz7, HW5	Lecture, In Class- Quiz, HW	
10-12	<i>Lecture 8: Alkyl halides: <u>Elimination reactions</u>; <u>Nucleophilic substitutions</u></i>	1,3,4	Quiz8, HW6	Lecture, In Class- Quiz, HW	
13-15	<i>Lecture 9: Diels and Aromatic compounds: Conjugated unsaturated systems; <u>Electrophilic aromatic substitutions</u></i>	1,3,4	Quiz9, HW7	Lecture, In Class- Quiz, HW	
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
In-class exercises/quizzes (15%)	80% Pass	80% Pass	80% Pass	80% Pass	80% Pass
Homework exercises (10%)	90% Pass	90% Pass	90% Pass	90% Pass	90% Pass
Midterm exam (35%)	70% Pass	70% Pass	70% Pass	70% Pass	70% Pass
Final exam (40%)	80% Pass		80% Pass	80% Pass	

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

5. Rubrics (optional)

1. Grading checklist
2. Holistic rubric

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

3. Analytic rubric

6. Date revised: May 24, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

Course Code: **BTBC206IU**

Course designation	<i>This course is specifically designed for students of Biochemistry. It is the second part of a 2- semester course in Organic Chemistry. This particular module provides fundamental information on functional groups, mechanisms of their common reactions with a biological emphasis.</i>						
Semester(s) in which the course is taught	1, 2						
Person responsible for the course	Dr. Le Quang Phong						
Language	English						
Relation to curriculum	Compulsory						
Teaching methods	Lecture, lesson, homework, quiz.						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	3				
	Contact hours	37.5	37.5	0			
	Self-Study hours	90	90	0			
	Total workload	127.5	127.5	0			
Credit points	3 credits (4.62 ECTS)						
Recommended prerequisites for joining the course	Organic Chemistry 1						
Course objectives	Students will be provided with skills of recognizing different types of functional groups and reactions. Students will be provided with the ability to analyze and draw reaction mechanisms.						

Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand the structures of alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids, amines, enols and enolates and their properties, reactions	
	Skill	CLO2. Know how to draw the mechanism of the functional groups mentioned in the course.	
	Apply	CLO3. Able to predict and explain products of certain reactions.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Alcohols, Phenols	2	T, U
	Ethers, Epoxides, Thiols	1	T, U
	Aldehydes, ketones	2	T, U
	Carboxylic acids, Carboxylic acids derivatives:	3	T, U
	Enols and enolates	2	T, U
	Aldol condensation and Claisen condensation reactions	2	T, U
	Amine	2	T, U
Examination forms	Multiple-choice questions, written questions		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed based on their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	[1] Organic Chemistry, 7th Edition, 2007, John McMurry [2] Organic Chemistry with a Biological Emphasis, LibreTexts Open Access, 2016, Timothy Soderberg [3] Organic Chemistry, 12th Edition, 2016, T.W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder [4] Organic Chemistry, 8th Edition, 2013, L.G. Wade Jr.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-3) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			M					
2			M					
3		H						

3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessme nts	Learning activities	Resources
1-2	<i>Lecture 1 and 2: Alcohols, Phenols:</i> Synthesis and reactions	1,2, 3	Quiz1, HW1	Lecture, In Class-Quiz, HW	
3	<i>Lecture 3: Ethers, Epoxides, Thiols:</i> Synthesis and reactions	1,2, 3	Quiz2, HW2	Lecture, In Class-Quiz, HW	
4-5	<i>Lecture 4: Aldehydes, ketones:</i> <u>Nucleophilic carbonyl addition reactions</u> Sugars as intramolecular hemiacetals and hemiketals Glycosidic bonds	1,2, 3	Quiz3, HW3	Lecture, In Class-Quiz, HW	
6-8	<i>Lecture 5: Carboxylic acids, Carboxylic acids derivatives:</i> <u>Nucleophilic acyl substitution</u> Nucleophilic acyl substitution in the context of metabolism	1,2, 3	Quiz4, HW4	Lecture, In Class-Quiz, HW	
	Midterm				
9-10	<i>Lecture 6: Enols and enolates:</i> <u>Reaction at the α Carbon of carbonyl compounds</u>	2,3	Quiz5, HW5	Lecture, In Class-Quiz, HW	
11-12	<i>Lecture 7: Aldol condensation and Claisen condensation reactions. Biochemical aldol addition.</i> Decarboxylation and fatty acid metabolism. Biochemical Claisen condensation reactions. Biotin-dependent carboxylation	2,3	Quiz6, HW6	Lecture, In Class-Quiz, HW	
13-14	<i>Lecture 8: Amine:</i> Synthesis and reactions	1,2, 3	Quiz7, HW7	Lecture, In Class-Quiz, HW	

15	<i>Final exam Review</i>	2,3	Quiz8	Review-Test	
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class exercises/quizzes (15%)	80% Pass	80% Pass	80% Pass
Homework exercises (10%)	90% Pass	90% Pass	90% Pass
Midterm exam (35%)	70% Pass	70% Pass	70% Pass
Final exam (40%)	80% Pass	80% Pass	80% Pass

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

5. Rubrics (optional)

1. Grading checklist

2. Holistic rubric

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

3. Analytic rubric

6. Date revised: May 24, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Organic Chemistry Lab

Course Code: **BTBC207IU**

1. General information

Course designation	The organic chemistry laboratory course introduces the student to fundamental techniques and procedures in extraction, purification, synthesis and characterization of organic compounds and simple reactions used in the organic chemistry laboratory. In addition, the student will be trained in the proper way to write a scientific laboratory report.				
Semester(s) in which the course is taught	1,2				
Person responsible for the course	Dr. Lê Quang Phong				
Language	English				
Relation to curriculum	Fundamental				
Teaching methods	lecture, lab work.				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>		2	
	Contact hours	50	0	50	
	Self-Study hours	60	0	60	
	Total workload	110	0	110	
Credit points	2 credits (4.00 ECTS)				
Required and recommended prerequisites for joining the course	Organic chemistry 1				
Course objectives	The course will introduce and emphasize students on the techniques of purification, extraction, and characterization of organic compounds from plant, food, and other natural resources.				

Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Utilize basic knowledge gained from General Chemistry course to perform common calculations, including mass balance, limiting reagent, and percent yield. CLO2. Engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately, using general guidelines and basic knowledge about the common hazards associated with them in an organic chemistry laboratory. CLO3. Predict the outcome of several common organic reaction types through a basic understanding of starting materials, functional groups, mechanism, and typical reaction conditions. Characterize prepared substances by physical/spectroscopic means.	
	Skill	CLO4. Develop laboratory skills in handling chemicals, assembling glassware and performing the following techniques as a part of synthetic procedures: distillation, reflux, separation, isolation, and crystallization.	
	Attitude	CLO5. Ability to analyze, predict, and explain many aspects of everyday life using laboratory skills and organic chemistry concepts.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (4 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Lab 1: Laboratory safety	1	I, T
	Lab 2: Melting point determination	1	I, T,U
	Lab 3: Recrystallization	1	I, T,U
	Lab 4: Thin layer chromatography	1	I, T,U
	Lab 5: Column chromatography	1	I, T,U
Lab 6: Simple distillation	1	I, T,U	
Lab 7: Reflux reaction	1	I, T,U	

	Lab 8: Liquid – liquid extraction	1	I, T,U
	Lab 9: Fischer ester synthesis	1	I, T,U
	Lab 10: Solvent effects in an SN1 Solvolysis reaction a kinetics study	1	I, T,U
Examination forms	Multiple-choice questions, short-answer questions		
Study examination requirements and	Students are expected to spend at least 8 hours per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that if students attend less than 80% of scheduled classes they may be refused final assessment. Regular attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted. The Organic Chemistry Lab requires full attendance in order to pass the course.		
Reading list	[1]“Organic Chemistry” by Francis A. Carey,Robert M. Giuliano (8th Edition, 2011) [2]“Organic Chemistry” by T.W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder (11th Edition 2013) [3]“Organic Chemistry” by Jonathan Clayden, Nick Greeves, Stuart Warren and Peter Wothers (2008) [4] Department of Applied Chemistry – Organic Chemistry Lab Manual.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-5) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CLOs	1	2	3	4	5	6	7	8
1				L				
2					M			
3			M					
4				M				
5		M						

3. Planned learning activities and teaching methods.

Week	Topic	CLO	Assessment s	Learning activities	Resources
1	Lab 1: Orientations: Laboratory safety	1		Lecture presentation	[1],[2],[3],[4]

				Group forming	
2	Lecture 2: Melting point determination	1,2,3	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
3	Lecture 3: Recrystallization	1,2,3	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
4	Lecture 4: Thin layer chromatography	1,2,3	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
5	Lecture 5: Column chromatography	1,2,3	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
6	Lecture 6: Simple distillation	1,2,3	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
7	Midterm test				
8	Lab 7: Reflux reaction	1,2,3	Group report	- Introduce practical procedure	[1],[2],[3],[4]

				- Solve problems - Group working	
9	Lab 8: Liquid – liquid extraction	1,2,3	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
10	Lab 9: Fischer ester synthesis	1,2,3	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
11	Lab 10: Solvent effects in an SN1 Solvolysis reaction a kinetics study	1,2,3	Group report	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
12	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Assignment (70%): Performance (10%), Report (40%), Midterm test (20%)	Test 70%Pass	Test, Report 70%Pass	Performance 90%Pass	Test 50%Pass	Test 50%Pass
Final (30%)	80%Pass	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)

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	5		
Introduction demonstrates thorough knowledge of relevant background and prior work	5		
Summary of methods and experiment procedures	5		
Results contain enough information of experiments	20		
Analysis and discussion demonstrate good subject mastery	20		
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, citation and syntax	10		
Clear lab notes and easy to read	10		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

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 the task are included.

3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion);	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences

	evidence and perspectives discussed in priority order.	(consequences and implications) are identified clearly.	some related outcomes (consequences and implications) are identified clearly.	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
Organizational	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability

	compelling, and the speaker appears polished and confident.	interesting, and the speaker appears comfortable.	understandable, and the speaker appears tentative.	of the presentation, and the speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May 24th, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Fundamentals of Analytical Chemistry

Course Code: **BTBC213IU**

1. General information

Course designation	This course is designed to provide the fundamentals of analytical chemistry along with practical principles for working in laboratories, as a requirement for students of biochemistry					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	Pham Thi Hoa					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	lecture, assignments, presentation					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		Credit	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	General Chemistry					
Course objectives	This course is designed to provide the fundamentals of analytical chemistry along with practical principles for working in laboratories, as a requirement for students of biochemistry					
Course learning outcomes	Upon the successful completion of this course students will be able to:					

	Competency level	Course learning outcome (CLO)		
	Knowledge	CLO1. Describe the principles of analytical chemistry CLO2. Apply principles of analytical chemistry in chemical analysis		
	Skill	CLO3. Construct analysis with acid-based titration and redox titration		
	Attitude	CLO4. Demonstrate ethical and responsibility of chemist in providing analytical data.		
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)			
	Topic	Weight	Level	
	Introduction to Analytical Chemistry	0.5	I, T	
	Chemical measurement	1	T, U	
	Statistics	2	T, U	
	Quality assurance	1	T	
	Chemical equilibrium	1	T, U	
	Acid-base titration	1	T	
	Fundamental of electrochemistry	2	T, U	
	Redox titration	1.5	T	
Examination forms	<i>e.g. oral presentation, essay, etc.</i> Multiple-choice questions, short-answer questions			
Study and examination requirements	<i>Requirements for successfully passing the module</i> 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	<i>Names of textbooks, articles, etc.</i> 1. “Quantitative chemical analysis” By Harris, Daniel C. Macmillan (9th Edition, 2016) Chapter 0 to Chapter 17			

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1 -11) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	L							
2				M	H			
3		M						
4								

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	The Analytical process	1		Lecture, Discussion,	[1]. 0
2	Chemical measurement	1, 4	Quiz 1	Lecture, Discussion, Inclass-Quiz	[1]. 1
3-4	Experimental error	1, 4	Quiz 2	Lecture, Discussion, Inclass-Quiz	[1] . 3
5-6	Statistical analysis	2	Quiz 3	Lecture, Discussion, Inclass-Quiz	[1]. 4
7-8	Quality assurance and calibration methods	2	Quiz 4	Lecture, Discussion, Inclass-Quiz	[1]. 5
9	Midterm				
10-11	Chemical equilibrium	2	Quiz 5	Lecture, Discussion, Inclass-Quiz	[1]. 6
12-13	Acid-base Titration	2, 3	Quiz 6	Lecture, Discussion, Inclass-Quiz	[1]. 7, 9, 11
14	Funadmental of Electrochemistry	2		Lecture, Discussion,	[1]. 14

15	Redox titration	2, 3	Quiz 7	Lecture, Discussion, Inclass-Quiz	[1]. 16
16	Revision			Review - test	
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
In-class exercises/quizzes (30%)	x	x	x	X
Midterm exam (30%)	x	x		X
Final exam (40%)		x	x	X

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes	
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.

2. 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 leaves some	Issue/ problem to be considered critically is stated without

	delivering all relevant information necessary for full understanding.	not seriously impeded by omissions.	terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	clarification or description.
Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	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	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

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

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the 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 supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.

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

Source: Association of American Colleges and Universities

6. Date revised: May 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Fundamentals of Analytical Chemistry Laboratory

Course Code: **BTBC214IU**

1. General information

Course designation	This course is designed to provide the practical skills in making chemical analysis and applied theory learned in the course “Fundamental of analytical chemistry”			
Semester(s) in which the course is taught	1, 2			
Person responsible for the course	<i>Pham Thi Hoa</i>			
Language	English			
Relation to curriculum	<i>Compulsory</i>			
Teaching methods	<i>lecture, coaching, assignment/report</i>			
Workload (incl. contact hours, self-study hours)		Lecture	Lab	
	<i>Credit</i>		1	
	Contact hours	25	0	25
	Self-Study hours	30	0	30
	Total workload	55	0	55
Credit points	1 credit (2.00 ECTS)			
Required and recommended prerequisites for joining the course	Fundamental of Analytical Chemistry			
Course objectives	This course is designed to provide practical skills of analytical chemistry along with practicing principles for working in laboratories, as a requirement for students of biochemistry			
Course learning outcomes	Upon the successful completion of this course students will be able to:			

	Competency level	Course learning outcome (CLO)		
	Knowledge	CLO1. Applied principles of analytical chemistry in chemical analysis (applied)		
	Skill	CLO2. Exercise analysis with acid-base titration and redox titration (apply)		
	Attitude	CLO3. Demonstrate ethical and responsibility of chemist in providing analytical data (apply)		
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)			
	Topic		Weight	Level
	Calibration of volumetric glassware		2	T
	Gravimetric determination of Calcium as CaC2O4.H2O		2	T
	Preparing standard acid and base		2	T
	Using a pH electrode for an acid-base titration		2	T
	Analysis of an acid-base: Grant plot		2	T
Examination forms	<i>e.g. oral presentation, essay, etc.</i> Reports, Multiple-choice questions, short-answer questions			
Study and examination requirements	<i>Requirements for successfully passing the module</i> 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	<i>Names of textbooks, articles, etc.</i> 1. Lab manual			

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes/Program/Student Learning Outcomes (ILOs/SLO) (1 -11) and level of contribution of CLO to ISLO (Low – Medium – High) is shown in the following table:

	ILO

CLO	1	2	3	4	5	6	7	8
1			M					
2		M						
3					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Calibration of volumetric glassware	1, 2, 3	Report 1	Lecture, Practice, homework	[1]. 1
2	Gravimetric determination of Calcium as $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$	1, 2, 3	Report 2	Lecture, Practice, homework	[1]. 2
3	Preparing standard acid and base	1, 2, 3	Report 3	Lecture, Practice, homework	[1]. 3
4	Using a pH electrode for an acid-base titration	1, 2, 3	Report 4	Lecture, Practice, homework	[1]. 4
5	Analysis of an acid-base: Grant plot	1, 2, 3	Report 5	Lecture, Practice, homework	[1]. 5
6	Final test	1, 2, 3	Examination	Examination	

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
Class participation (20%)			X
Reports (60%)	x	x	X
Final exam (20%)	x	x	x

Note: %Pass: Target that 70% of students having scores greater than 650 out of 100.

5. Rubrics (optional)

1. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion);	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences

	evidence and perspectives discussed in priority order.	(consequences and implications) are identified clearly.	some related outcomes (consequences and implications) are identified clearly.	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
Organizational	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	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability

	compelling, and speaker appears polished and confident.	interesting, and speaker appears comfortable.	understandable, and speaker appears tentative.	of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

Course Name: Instrumental Analysis

1. General information

Course designation	This course is designed to provide the fundamentals of instrumental analysis along with practical principles for working in laboratories, as a requirement for students of biochemistry.						
Semester(s) in which the course is taught	1, 2						
Person responsible for the course	Pham Thi Hoa						
Language	English						
Relation to curriculum	Compulsory						
Teaching methods	lecture, assignments, presentation						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		Credit	3				
	Contact hours	37.5	37.5	0			
	Self-Study hours	90	90	0			
	Total workload	127.5	127.5	0			
Credit points	3 credits (4.62 ECTS)						
Required and recommended prerequisites for joining the course	Fundamentals of analytical chemistry						
Course objectives	This course is designed to provide the fundamentals of instrumental analysis along with practical principles for working in laboratories, as a requirement for students of biochemistry.						
Course learning outcomes	Upon the successful completion of this course students will be able to:						

	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Describe the principles of spectroscopy and analytical separation in analytical chemistry CLO2. Describe the application of spectroscopy and analytical separation in different instruments	
	Skill	CLO3. Exercise analysis with different spectrophotometer and chromatography	
	Attitude	CLO4. Demonstrate ethical and responsibility of chemists in providing analytical data using instrumental analysis.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to Instrumental analysis	0.5	I, T
	Spectroscopy	2	T
	Application of spectrophotometry	1.5	T
	Atomic spectroscopy	1	T
	Mass spectroscopy	1	T
	Introduction to analytical separation	2	T
	Gas chromatography	1	T
	Liquid chromatography	1	T
Examination forms	<i>e.g. oral presentation, essay, etc.</i> Multiple-choice questions, short-answer questions		
Study and examination requirements	<i>Requirements for successfully passing the module</i> 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	<i>Names of textbooks, articles, etc.</i>		

	1. “Quantitative chemical analysis” By Harris, Daniel C. Macmillan (9th Edition, 2016) Chapter 0 to Chapter 17

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			M					
2		M						
3		M						
4					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Instrumental analysis	1		Lecture, Discussion,	[1]. 1
2-3	Spectroscopy	1, 3	Quiz 1	Lecture, Discussion, In Class-Quiz	[1]. 18, 20
4-5	Application of spectrophotometry	2, 3	Quiz 2	Lecture, Discussion, In Class-Quiz	[1]. 19
6-7	Atomic spectroscopy	2	Quiz 3	Lecture, Discussion, In Class-Quiz	[1]. 21
8	Mass spectroscopy	2		Lecture, Discussion,	[1]. 22
9	Midterm				
9	Mass spectroscopy	2	Quiz 4	Lecture, Discussion, In Class-Quiz	
10-11	Introduction to analytical separation	1	Quiz 5	Lecture, Discussion, In Class-Quiz	[1]. 23
12-13	Gas chromatography	2	Quiz 6	Lecture, Discussion, In Class-Quiz	[1]. 24

14-15	Liquid chromatography	2	Quiz 7	Lecture, Discussion, In Class-Quiz	[1]. 25
16	Revision			Review - test	
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
In-class exercises/quizzes (30%)	x	x	x	X
Midterm exam (30%)	x	x		X
Final exam (40%)		x	x	X

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

5. Rubrics (optional)

1. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes	
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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

2. 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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable

	consistently observable and is skillful and makes the content of the presentation cohesive.	consistently observable within the presentation.	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) 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 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 establishes the presenter's	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.	credibility/ authority on the topic.	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

6. Date revised: May 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
 School of Biotechnology
 Department of Applied Chemistry

COURSE SYLLABUS

Course Name: INSTRUMENTAL ANALYSIS LAB

Course Code: BTBC216IU

1. General information

Course designation	This course is designed to provide the practical skills in making chemical analysis and applied theory learned in the course “Instrumental analysis”					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	<i>Pham Thi Hoa</i>					
Language	English					
Relation to curriculum	<i>Compulsory</i>					
Teaching methods	<i>lecture, coaching, assignment/report</i>					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>		1		
Contact hours	25		0	25		
Self-Study hours	30		0	30		
Total workload	55		0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	Instrumental Analysis					

Course objectives	This course is designed to provide practical skills of analytical chemistry with instruments along with practicing principles for working in laboratories, as a requirement for students of biochemistry		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CL01. Applied principles of instrumental analysis in chemical analysis	
	Skill	CLO2. Exercise out analysis with acid-base titration and redox titration	
	Attitude	CLO3. Demonstrate ethical and responsibility of chemists in providing analytical data.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (5 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Spectrophotometric determination of Iron in Vitamin tablets	2	T
	Microscale spectrophotometric measurement of iron in food by standard addition	2	T
	Spectrophotometric analysis of a mixture: caffeine and benzoic acid in soft drinks	2	T
	Thin layer chromatography of vegetables	2	T
	Determination of Vitamin C in fruits by HPLC	2	T
Examination forms	<i>e.g. oral presentation, essay, etc.</i> Reports, Multiple-choice questions, short-answer questions		
Study and examination requirements	<i>Requirements for successfully passing the module</i> 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	<i>Names of textbooks, articles, etc.</i> 1. Lab manual		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1		M						
2				M				
3					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Spectrophotometric determination of Iron in Vitamin tablets	1, 2, 3	Report 1	Lecture, Practice, homework	[1]. 1
2	Microscale spectrophotometric measurement of iron in food by standard addition	1, 2, 3	Report 2	Lecture, Practice, homework	[1]. 2
3	Spectrophotometric analysis of a mixture: caffeine and benzoic acid in soft drinks	1, 2, 3	Report 3	Lecture, Practice, homework	[1]. 3
4	Thin layer chromatography of vegetables	1, 2, 3	Report 4	Lecture, Practice, homework	[1]. 4

5	Determination of Vitamin C in fruits by HPLC	1, 2, 3	Report 5	Lecture, Practice, homework	[1]. 5
6	Final test	1, 2, 3	Examination	Examination	

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Class participation (20%)			X
Reports (60%)	x	x	X
Final exam (20%)	x	x	x

Note: %Pass: Target that 70% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

5.1. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes	
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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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

	understanding.	impeded by omissions.	ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	
Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged.	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective,	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

	Others' points of view are synthesized within position (perspective, thesis/hypothesis).	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	Language choices are thoughtful and generally support the effectiveness	Language choices are mundane and commonplace and partially	Language choices are unclear and minimally support the effectiveness of the

	effectiveness of the presentation. Language in presentation is appropriate to the audience.	of the presentation. Language in presentation is appropriate to the audience.	support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the 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

6. Date revised: March 2022

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
 School of Chemical and Environmental
 Engineering

COURSE SYLLABUS

Course Name: Environmental Science

Course Code: **PE014IU**

1. General information

Course designation	This course provides the basic knowledge about environmental science; population growth and utilization of natural resources and the environment; natural resources and current exploitation; pollution and its impacts, environmental economic and sustainable development. It also aims to raise students' awareness about possible impacts of human activities on the environment and natural resources in order to apply relevant economic practices.					
Semester(s) in which the course is taught	1,2,3					
Person responsible for the course	Assoc.Prof. Tran Tien Khoi Dr. Tran Thanh Tu					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, lesson, homework, presentation					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	None					

Course objectives	Students will be provided with the knowledge about environmental science; population growth and utilization of natural resources and the environment; natural resources and current exploitation; pollution and its impacts, environmental economic and sustainable development. Through this unit, students will be more aware of possible impacts of human activities on the environment and natural resources to apply relevant economic practices.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Recognize the current environmental issues and the roles of ecosystem and biodiversity. CLO2. Explain the growth of human population and its impacts to the ecosystem, biodiversity and the environment. CLO3. Describe the impacts of food, soil, and pest management, principles of water resources and water pollution, energy consumption and its impacts to the environment. CLO4. Identify the problems related to air pollution, climate disruption, and ozone depletion as well as environmental economics, politics, and environmental worldviews.	
	Skill	CLO5. Describes the issues related to ecosystem, biodiversity, human population growth, foot management, water and energy consumption, environmental pollution, climate change, etc. via in-class presentation.	
	Attitude	CLO6. Discuss the impacts of human activities to the ecosystem, biodiversity and the environment.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Environmental Issues	1	I,T
Ecosystem	1	I,T	
Biodiversity and Evolution Biodiversity: Species Interaction and Population Control	1	I,T	

	Human Population	1	I,T
	Food, Soil, and Pest Management	1	I,T
	Water Resources and Water Pollution	2	I,T
	Energy	2	I,T
	Air Pollution, Climate Disruption, and Ozone Depletion	2	I,T
	Environmental Economics, Politics, and Worldviews	1	I,T
Examination forms	Multiple-choice questions, presentation		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	[1] Miller T.G. and Spoolman S.E., <i>Environmental Science</i> , 15 th edition, Cengage Learning Publisher, USA, 2015.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-6) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	M							
2	M							
3	M							
4					L			
5					L			
6					L			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Environmental Issues	1,6		Lecture, Discussion	[1] Chapter 1
2	Ecosystem	1	Quiz1	Lecture, Discussion, Quiz	[1] Chapter 3

3	Biodiversity and Evolution Biodiversity: Species Interaction and Population Control	1	Quiz2	Lecture, Discussion, Quiz	[1] Chapter 4,5
4	Human Population	2,5	IP1 Quiz3	Lecture, Presentation, Discussion, Quiz	[1] Chapter 6
5	Food, Soil, and Pest Management	3,5	IP2	Lecture, Presentation, Discussion	[1] Chapter 10
6	Water Resources and Water Pollution: Part 1 – Water Resources	3,5	IP3	Lecture, Presentation, Discussion	[1] Chapter 11
7	Water Resources and Water Pollution: Part 2 – Water Pollution	3	Quiz4	Lecture, Discussion, Quiz	[1] Chapter 11
8	Energy: Part 1 – Nonrenewable energies	3,5	IP4	Lecture, Presentation, Discussion	[1] Chapter 13
	Midterm				
9	Energy: Part 2 – Renewable energies	3,5	IP5 Quiz5	Lecture, Presentation, Discussion, Quiz	[1] Chapter 13
10	Air Pollution, Climate Disruption, and Ozone Depletion – Part 1: Air Pollution	4,5	IP6	Lecture, Presentation, Discussion	[1] Chapter 15
11	Air Pollution, Climate Disruption, and Ozone Depletion – Part 2: Climate Disruption and Ozone Depletion	4	Quiz6	Lecture, Discussion, Quiz	[1] Chapter 15
12	Environmental Economics, Politics, and Worldviews	4,5	IP7	Lecture, Presentation, Discussion	[1] Chapter 17
13□15	Group presentation	5	IP8□10	Lecture, Presentation, Discussion	
	Reserved week				
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6

In-class presentation (IP) and Quiz (30%)	IP1,2 Quiz 1,2 60%Pass	IP3□5 Quiz3 60%Pass	IP6□8 Quiz 4,5 60%Pass	IP9,10 Quiz6 60%Pass	IP1□10 60%Pass	
Midterm exam (30%)	PartI: Q3□16 PartII: Q1□8 PartIII: Q1□8 60%Pass	PartI: Q17□20 PartII: Q9,10 PartIII: Q9,10 60%Pass				PartI: Q1□2 60%Pass
Final exam (40%)			PartI: Q1□12 PartII: Q1□6 PartIII: Q1□6 60%Pass	PartI: Q13□20 PartII: Q6□10 PartIII: Q6□10 60%Pass		

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

5. Rubrics (optional)

1. Rubric for assessment questions in assignment/HW and exam.

Criteria	Level				
	Excellent	Good	Average	Weak	
	100	75	50	25	0
Writing part	Totally correct in method with the differences (if any) in results is within 5%	Calculations mainly correct with 1-2 mistakes and the results are not strongly affected (within 10%)	Direction is correct, calculations with 50% steps having mistakes and the results are strongly affected	Calculation is done but mainly wrong or less relevant	No calculation; calculation is not relevant
MCQs part	Answer is totally correct	Answer is correct at 75%	Answer is correct at 50%	Answer is not clear and less relevant	No answer; answer is not relevant

2. Rubric for evaluating presentation tasks

Oral communication value rubric:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable

	clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	clearly and consistently observable within the presentation.	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the 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 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 establishes the presenter's	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.	credibility/ authority on the topic.	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.

6. Date revised: May 2023

School of Chemical and Environmental Engineering

Course designation	<i>On campus course</i>						
Semester(s) in which the course is taught	3						
Person responsible for the course	<i>Assoc. Prof. Nguyen Tan Khoi</i>						
Language	English						
Relation to curriculum	<i>Compulsory</i>						
Teaching methods	<i>lecture, lesson.</i>						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	2				
	Contact hours	25	25	0			
	Self-Study hours	60	60	0			
	Total workload	85	85	0			
Credit points	2 credits (3.08 ECTS)						
Required and recommended prerequisites for joining the course	Calculus I, II						
Course objectives	• Be able to perform standard statistical tests with common statistical packages • Respect different opinions • Understanding (of other's needs) • Active in finding solution for challenges or problems • Enhance students' critical thinking in domains involving judgments based on data and stimulate the type of independent						

	thinking requiring research beyond the confines of the textbook, through projects, interdisciplinary examples and exercises	
Course learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	Course learning outcome (CLO)
	Knowledge	CLO1. Learn to understand the main features of statistics; Understand the role of statistics and data analytic methods. Understand the fundamental principles of statistical inference CLO2. Be able to distinguish the general principles underlying the most common tests
	Skill	CLO3. Be able to to analyze statistical data properly CLO4. Know the assumptions of common tests and impacts of violations
	Attitude	CLO5. Active in finding solution for challenges or problems Be able to solve practical problems and analyze the solutions
Content	Lecture 1: Basic concepts (CLO1, CLO2) - Populations, unit, observations, samples - Sampling, random samplings - Sample parameters - Descriptive and inferential statistics Processing data and presenting data - Scale of measurement; Frequency table - Histogram, frequency polygon, dot plot, bar graph, pie graph, frequency curve, scatter diagram Sample parameters: Central Tendency: mean, median, mode. Variability: standard deviation, variance, degree of freedom, coefficient of variation Lecture 2: (CLO1, CLO3, CLO4) Probability: Frequency; definitions of probability; rules for probability calculation. Probability distribution, discrete - Binomial - Poisson Lecture 3: Continuous distribution of probability: (CLO1, CLO3, CLO4) - normal - standardized normal Continuous distribution of probability: - t-distribution - chi-square distribution - F-distribution.	

	Lecture 4: Estimation of parameters (CLO1, CLO2, CLO3, CLO4) - sample mean - population proportion - sample variance Central Limit Theorem Interval of confidence Lecture 5: Hypothesis testing (CLO1, CLO2) - Principles - Experimental design - Hypothesis/conditions Comparing means - t-test - F-test - testing population proportion. Lecture 6: ANOVA (CLO1, CLO2) - one way ANOVA - two-way ANOVA - Tukey test, LSD test. Lecture 7: Non-parametric tests. (CLO1, CLO2) Lecture 8: Regression analysis. (CLO1, CLO2)
Examination forms	<i>Written exams (Midterm+Final)</i>
Study and examination requirements	Students are expected to spend at least 8 hours per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that students may be refused to take final assessment if they attend less than 80% of scheduled classes. Regular attendance is essential for successful performance and learning in this course, particular in the view of the interactive teaching and learning approach adopted.
Reading list	Textbooks: Jim Fowler, Lou Cohen, and Ph. Jarvis. 1998. Practical Statistics for Field Biology. John & Wiley & Sons. 2nd Edition. References: Chap T. Le. 2003. Introductory Biostatistics. John & Wiley & Sons. J. Susan Milton and Jesse C. Arnold. 2003. Introduction to Probability and Statistics. McGraw-Hill. 4th Edition.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1						M		
2						M		
3	H						M	

4	H						M	
5						M		

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Basic concepts - Populations, unit, observations, samples - Sampling, random samplings - Sample parameters - Descriptive and inferential statistics Processing data and presenting data - Scale of measurement; Frequency table - Histogram, frequency polygon, dot plot, bar graph, pie graph, frequency curve, scatter diagram Sample parameters: Central Tendency: mean, median, mode	CLO1, CLO2	10%	- Lecture presentation - Group forming. - Class discussion - Read book & lecture 2.	
2	Lecture 2: Sample parameters (cont.): Variability: standard deviation, variance, degree of freedom, coefficient of variation Probability: Frequency; definitions of probability; rules for probability calculation. Probability distribution, discrete - Binomial - Poisson	CLO1, CLO3, CLO4	10%	- Lecture presentation - Class discussion - Read book & lecture 3.	
3	Lecture 3: Continuous distribution of probability: - normal - standardized normal Continuous distribution of probability: - t-distribution	CLO1, CLO3, CLO4	10%	- Lecture presentation - Class discussion - Read book & lecture 4.	

	- chi-square distribution - F-distribution.				
4	Lecture 4: Estimation of parameters - sample mean - population proportion - sample variance Central Limit Theorem Interval of confidence	CLO1, CLO2, CLO3, CLO4	15%	- Class discussion - Read book & lecture 5.	
5	Lecture 5: Hypothesis testing - Principles - Experimental design - Hypothesis/conditions Comparing means - t-test - F-test - testing population proportion.	CLO1, CLO2	15%	- Lecture presentation - Class discussion - Read book & lecture 6.	
6	Midterm				
10	Lecture 6: ANOVA - one way ANOVA - two-way ANOVA - Tukey test, LSD test.	CLO1, CLO2	15%	- Lecture presentation - Class discussion - Read book & lecture 7.	
11	Lecture 7: Non-parametric tests	CLO1, CLO2	15%	- Lecture presentation - Class discussion - Read book & lecture 8.	
12	Lecture 8: Regression analysis.	CLO1, CLO2	20%	- Lecture presentation - Class discussion	
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5

Written exam (70%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Quiz (20%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Class participation (10%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass

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

5. Date revised: May 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Practice in Biostatistics

Course Code: BT318IU

1. General information

Course designation	<i>The course will introduce students to the scope, nature, tools, language, and interpretation of elementary statistics. It will include descriptive statistics, inferential statistics, types of hypothesis testing methods, usage of statistical computer packages (Data analysis in Excel)</i>					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	MSc. Do Ngoc Phuc Chau					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, lesson, lab works, project, lab exam					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		Credit	0	1		
Contact hours	25		0	25		
Self-Study hours	30		0	30		
Total workload	55		0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	Calculus 1, Calculus 2, Biostatistics					
Course objectives	<i>The student can use Excel to analyze the data, how to conduct a survey-experiment and present the collected data, distinguish between hypothesis tests</i>					

Course learning outcomes	Upon the successful completion of this course students will be able to:			
	Competency level	Course learning outcome (CLO)		
	Knowledge	CLO1. Present the collected data from experiment CLO2. Distinguish different hypothesis testing methods for analysis		
	Skill	CLO3. Use Excel to present and analyze the data CLO4. Apply different statistic methods to acquire the information from collected data		
	Attitude	CLO5. An ability to obtain relevant knowledge of ethical as well as the associated plagiarism issue		
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (5 hours) Teaching levels: L (Lecture); D (Demonstrate); U (Utilize)			
	Week	Topics	Weight	Level
	1	Introduction - Processing data and presenting data - Calculating simple discrete and continuous distributions	1	L, D, U
	2	Simple hypothesis testing Carrying out simple hypothesis testing using Excel	1	L, D, U
	3	ANOVA and Non-parametric tests Carrying out ANOVA and non-parametric tests using Excel	1	L, D, U
	4	Regression and Normality test - Performing regression using Excel - Perform normality test	1	L, D, U
	5	Present the group project	1	U
	6	Lab examination	1	U
	Examination forms	- Group project on survey experiment to know data collection, summary, and data analysis: written report and presentation - Lab exam includes multiple choice questions and solving problems.		
Study and examination requirements	- Attendance: A full attendance of 100% is compulsory for the class sessions. Students will be assessed based on their participation. Questions and comments are strongly encouraged. - Students must get more than 50/100 points overall to pass this module.			
Reading list	1. Jim Fowler, Lou Cohen, and Ph. Jarvis. 1998. Practical Statistics for Field Biology. John & Wiley & Sons. 2nd Edition.			

	2. Chap T. Le. 2003. <i>Introductory Biostatistics</i>. John & Wiley & Sons. 3. J. Susan Milton and Jesse C. Arnold. 2003. <i>Introduction to Probability and Statistics</i>. McGraw-Hill. 4th Edition.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1		H						
2							L	
3		H						
4				M				
5					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction	1, 2, 3	Quiz 1	L, D, U	
2	Simple hypothesis testing	2, 3	HW 1	L, D, U	
3	ANOVA and Non-parametric tests	2, 3	HW 2	L, D, U	
4	Correlation and Normality tests	2, 3	Quiz 2	L, D, U	
5	Group project presentation	1, 2, 3, 4, 5	Written report	U	
6	Lab examination	2, 3, 4	Written exam	U	

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Quiz (20%)	Quiz 1 70%Pass	Quiz 1, 2 70%Pass	Quiz 1, 2 70%Pass		
Homework (30%)		HW 1, 2 70%Pass	HW 1, 2 70%Pass		
Group project (20%)	Report 90%Pass	Report 90%Pass	Report 90%Pass	Presentation 90%Pass	Report 90%Pass

Lab examination (30%)		All questions 80%Pass	All questions 80%Pass	All questions 80%Pass	

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

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
 School of Biotechnology
 Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Introduction to Biochemistry

Course Code: **BTBC102IU**

1. General information

Course designation	Biochemistry is the study of the molecular basis of life. This one-semester course is designed for Biochemistry students who are pursuing a Bachelor degree in Biochemistry.					
Semester(s) in which the course is taught	1,2					
Person responsible for the course	Hoang Le Son, Le Quang Phong, Nguyen Tan Khoi, Pham Thi Hoa,					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	lecture, lesson, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	2			
	Contact hours	25	25	0		
	Self-Study hours	60	60	0		
	Total workload	85	85	0		
Credit points	2 credits (3.08 ECTS)					
Required and recommended prerequisites for joining the course	None					
Course objectives	This course will emphasize on the fundamental concepts and applications of biochemistry. Five subspecialties of biochemistry will be introduced in this course, including Biochemical Pharmacology, Nutritional Biochemistry, Cosmetics, Agriculture and Industrial Biochemistry. This course will also provide an introduction to some of					

	the biochemistry careers available, looking at jobs and opportunities available to those who study biochemistry.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. • Discuss how biochemistry brings together the natural sciences to describe the chemical basis of living systems. • Describe events and scientists that have been significant during the historical development of biochemistry. • Discuss different field of studies in Biochemistry and their applications • Explore the wide range of jobs and career opportunities that become possible with a training in biochemistry. CLO2. Understanding where biochemistry will play a key role in scientific advances in the future.	
	Skill	CLO3. Development of their critical thinking and problem-solving skills.	
	Attitude	CLO4. Ability to explain many aspects of everyday life using biochemistry concepts.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (2 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to the course	0.5	I, T
	Agricultural biochemistry	1.5	T
	Pharmaceutical biochemistry	2	T
	Nutritional Biochemistry,	2	T
Biochemistry in Cosmetics	1	T	
Industrial application of Biochemistry	2	T	
Examination forms	Multiple-choice questions, short-answer questions		
Study examination requirements and	Students are expected to spend at least 4 hours per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that if students attend less than 80% of scheduled classes they may be refused final assessment. Regular		

	attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted.
Reading list	1. Nelson, D. L., Lehninger, A. L., & Cox, M. M. (2008). <i>Lehninger principles of biochemistry</i>. Macmillan. 2. Berg, J. M., Tymoczko, J. L., & Stryer, L. (2007). <i>Biochemistry</i>. Macmillan. 3. Voet, D., Voet, J. G., & Pratt, C. W. (2016). <i>Fundamentals of biochemistry: life at the molecular level</i>. John Wiley & Sons.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	M							
2			M					
3					M			
4			M					

The PLOs is designed to meet the skills and ability as defined by ABET and referenced to similar programs of prestigious universities in Singapore, United Kingdom, and United States of America. As a result, the PLOs of the BC program include:

- a) an ability to apply knowledge of mathematics, science, and engineering
- b) an ability to design and conduct experiments, as well as to analyze and interpret data
- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d) an ability to function on multi-disciplinary teams
- e) an ability to identify, formulate, and solve biochemistry science problems
- f) an understanding of professional and ethical responsibility
- g) an ability to communicate effectively
- h) the broad education necessary to understand the impact of science solutions in a global, economic, environmental, and societal context
- i) a recognition of the need for, and an ability to engage in life-long learning
- j) a knowledge of contemporary issues
- k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessment	Activity	Resource
1	Introduction to the course	1, 2		Lecture presentation, Class discussion	[1],[2],[3]
2	Agricultural biochemistry	1, 2, 3, 4	Quiz /HW/ Project	Lecture presentation, Class discussion	[1],[2],[3]
3-4	Pharmaceutical biochemistry	1, 2, 3, 4	Quiz /HW/ Project	Lecture presentation, Class discussion	[1],[2],[3]
5-6	Nutritional Biochemistry,	1, 2, 3, 4	Quiz /HW/ Project	Lecture presentation, Class discussion	[1],[2],[3]
7	Biochemistry in Cosmetics	1, 2, 3, 4	Quiz /HW/ Project	Lecture presentation, Class discussion	[1],[2],[3]
	Midterm examination				
8-9	Industrial application of Biochemistry	1, 2, 3, 4	Quiz /HW/ Project	Lecture presentation, Class discussion	[1],[2],[3]
10	Group presentation: Topic: Find a case study, an article or a product related to one of the biochemistry applications, and discuss the role of biochemistry understanding in that case.	1, 2, 3, 4		Group presentation and discussion	[1],[2],[3]
	Final examination	1, 2, 3, 4			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4

Quiz, Homework, Project (30%)	Quiz, HW 60%Pass	Quiz, HW 60%Pass	Project 60%Pass	Project 60%Pass
Midterm exam (30%)	... 60%Pass	... 60%Pass	... 60%Pass	... 60%Pass
Final exam (40%)	... 60%Pass	... 60%Pass	... 60%Pass	... 60%Pass

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

5. Rubrics (optional)

1. Grading checklist

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

2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description

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

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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 is)	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
Organizational	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.

Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Experimental design and technical communication

Course Code: BTBC217IU

Course designation	<i>This subject will provide knowledge on following:</i> • <i>Introduction to scientific research, hypothesis testing and experimental design in chemical science.</i> • <i>Structure of a research paper and how to complete a research writing.</i> • <i>Course projects that are used to evaluate how theory is applied in practice as well as to develop interpersonal skills.</i>																														
Semester(s) in which the module is taught	6,7,8																														
Person responsible for the module	Assoc. Prof. Nguyen Tan Khoi																														
Language	English																														
Relation to curriculum	Compulsory																														
Teaching methods	Lecture, case studies																														
Workload (incl. contact hours, self-study hours)	<table><tr><td></td><td><i>Lecture</i></td><td><i>Lab</i></td><td><i>Project</i></td><td><i>Internship</i></td><td><i>Thesis</i></td></tr><tr><td><i>Credit</i></td><td></td><td></td><td></td><td></td><td>3</td></tr><tr><td><i>Contact hours</i></td><td>37.5</td><td></td><td></td><td></td><td>37.5</td></tr><tr><td><i>Self-Study hours</i></td><td>90</td><td></td><td></td><td></td><td>90</td></tr><tr><td><i>Total workload</i></td><td>127.5</td><td></td><td></td><td></td><td>127.5</td></tr></table>		<i>Lecture</i>	<i>Lab</i>	<i>Project</i>	<i>Internship</i>	<i>Thesis</i>	<i>Credit</i>					3	<i>Contact hours</i>	37.5				37.5	<i>Self-Study hours</i>	90				90	<i>Total workload</i>	127.5				127.5
	<i>Lecture</i>	<i>Lab</i>	<i>Project</i>	<i>Internship</i>	<i>Thesis</i>																										
<i>Credit</i>					3																										
<i>Contact hours</i>	37.5				37.5																										
<i>Self-Study hours</i>	90				90																										
<i>Total workload</i>	127.5				127.5																										
Credit points	3 credits (4.62 ECTS)																														
Required and recommended prerequisites for joining the module	Biostatistics.																														

Course objectives	After studying this course, the students will be able to: • Understand scientific research process, research requirements and principles of experimental design in scientific research. • Apply common designs in scientific research. • Obtain practical experience in research implementation, data collection and analysis, oral presentation. • Perform effective technical communication in various contexts. • Enhance teamwork and problem-solving skills.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Apply common designs of experiments to address specific research hypotheses in the regime of physical sciences. CLO2. Learn strategies to write a scientific report	
	Skill	CLO3. Analyze and interpret data, and apply statistical reasoning to reach appropriate conclusions. CLO4. Communicate effectively with a range of audiences.	
	Attitude	CLO5. Synthesize the existing knowledge and findings in the literature to generate new research ideas.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to the constituents of an experimental design	2	T, U
	Models of experiments (CRD, BRD, Split-plot designs)	2	T, U
	Reviews on statistical tests	1	T, U
	Modeling and Optimization	3	T, U
	Case studies	1	T, U
	Introduction to Scientific Writing & Editing	1	I, T
	Guidelines for writing a piece of technical communication in various contexts	5	T, U
	Guidelines for oral presentations & poster presentations	1	T, U
Examination forms	Written test (experimental design, data analysis, discussion)		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory. Students will also be assessed on the basis of their class performance and participation.		

	Assignments/Examination: Students must have more than 50/100 points overall to pass this module.
Reading list	Textbook: - Gary W. Oehlert, A First Course in Design and Analysis of Experiments, University of Minnesota, 2010 References - Ruxton G.D. & Colegrave N. (2016) Experimental Design for the Life Sciences. Fourth Edition. Oxford University Press, UK. - Academic Writing for Graduate Students, 2nd edition, by J. M. Swales & C. B. Feak (The University of Michigan Press, 2005 or 2004) ISBN: 0-472-08856-4 [AWG] - Academic Writing Up Research: Experimental Research Report Writing for Students of English by R. Weissberg & S. Buker (Prentice Hall, 1990) ISBN: 0-13-970831-6 [W&B]

1. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (1-5) and Intended Learning Outcomes (1-8) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	M							
2							M	M
3	M							
4							M	
5		M						

2. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities
1-2	Introduction to the constituents of an experimental design	1,3	Case studies	Lecture, discussion
3	Models of experiments (CRD, BRD, Split-plot designs)	1,3	Case studies	Lecture, discussion
4	Reviews on statistical tests	1,3	Case studies	Lecture, discussion
5,6,7	Modeling (multivariable fittings) and Optimization (PSA, PSD and RSM techniques)	1,3	Case studies	Lecture, discussion
8	Case studies	1,3,5	Group assignment	Lecture, discussion
9-10	Midterm			

Week	Topic	CLO	Assessments	Learning activities
11	Introduction and course overview. Needs Evaluation. Diagnostic writing. Common practices in handling plagiarism and citation.	2,4	Case studies	Lecture, discussion
12	Introduction to Literature Review, Annotated Bibliography. Discussion of sample reviews of literature. Paraphrase, evaluation, citations. Summaries and comparative summaries (critiques). Short Paper Peer Critiques	2,4	Case studies	Lecture, discussion
13	Continue with literature reviews, meta-discourse of the research world. The use of tense in reviewing literature, indicating a gap. Quoting and elaboration on quotations. Documentation of sources.	2,4	Case studies	Lecture, discussion
14	Abstract writing conventions. Thesis/Dissertation Acknowledgments. Methods and materials	2,4	Case studies	Lecture, discussion
15	Writing up results and discussing different formats. Language focus as needed	2,4	Case studies	Lecture, discussion
16	Writing conference abstracts. Discussion of sample conference abstracts. IWP Peer Critiques	2,4	Case studies	Lecture, discussion
17	Continue with writing of various kinds of academic correspondence. Review, self-evaluation letter (in-class writing).	2,4	Case studies Group assignment	Lecture, discussion
18-20	Reserve week and Final exam			

3. Assessment plan

Course assessment policy

Methods	Frequency	(%)
Assignment	2	30
Mid-term exam	1	35
Final exam	1	35

Course assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Assignment 1 (20%)	Report (design) 70%Pass		Report (writing) 70%Pass		Report (idea) 70%Pass
Assignment 2 (20%)		Report (writing) 70%Pass		Group Presentation 90%Pass	
Midterm exam (30%)	Midterm exam (Q. 1) 70%Pass		Midterm exam (Q. 2-4) 70%Pass		

Final exam (30%)		Final exam 70%Pass	Final exam 70%Pass		

Note: %Pass (exam): % students have scores greater than 50 out of 100.

%Pass (report): % students have scores greater than 80 out of 100.

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

Course Name: Biochemistry 1

1. General information

Course designation	This course is part of two-part general biochemistry designed for students who are pursuing the bachelor's degree in biochemistry. Course covers some central concepts in general biochemistry. Topics include the sources, classification, structure, properties and functions of carbohydrates, lipids, proteins, nucleic acids and vitamins.						
Semester(s) in which the course is taught	1,2						
Person responsible for the course	Vu Thanh Ngoc, PhD						
Language	English						
Relation to curriculum	Specialization						
Teaching methods	lecture, lesson, project						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	3				
Contact hours		37.5	37.5	0			
Self-Study hours		90	90	0			
Total workload		127.5	127.5	0			
Credit points	3 credits (4.62 ECTS)						
Required and recommended prerequisites for joining the course	Biology						
Course objectives	The Biochemistry 1 course will provide students an understanding of sources, classification, structure, properties and functions of carbohydrate, lipid, protein, nucleic acid and vitamin						

Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Upon successful completion of this course, the students should be able to demonstrate basic knowledge of the sources, classification, structure, properties and functions of carbohydrate, lipid, protein, nucleic acid and vitamin	
	Skill	CLO2. Determine function and relationship of compounds in the human body. CLO3. Analyze biochemical parameters in the human body with different backgrounds.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to chemistry of life and biological molecules	1	I, T
	Carbohydrates: sources, classification, structure, properties, functions.	2.5	I, T
	Lipids and membranes: sources, classification, structure, properties, functions	2.5	I, T
	Amino acids, protein: sources, classification, structure, properties, functions	3	T, U
	Nucleic acid: sources, classification, structure, properties, functions	3	T, U
	Vitamins: sources, classification, structure, properties, functions	3	T, U
Examination forms	Multiple-choice questions, short-answer questions		
Study and examination requirements	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent, requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.		
Reading list	[1] Voet, Voet and Pratt, Fundamentals of Biochemistry, Third Edition, Wiley, 2008		
	[2] Lehninger: Principles in Biochemistry, 5th edition, 2008		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-3) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2			M					
3		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to chemistry of life and biological molecules	1		Lecture presentation, Group forming, Class discussion	[1],[2]
2,3	Carbohydrates: sources, classification, structure, properties.	1,2,3	Project	Lecture presentation, Class discussion	[1],[2]
4,5,6	Carbohydrates: functions. Lipids and membranes: sources, classification, structure, properties, functions.	1,2,3	Project	Lecture presentation, Class discussion	[1],[2]
7,8	Amino acids, protein: sources, classification, structure, properties, functions	1,2,3	Project	Lecture presentation, Class discussion	[1],[2]
9	Midterm exam				
10	Amino acids, protein: properties, functions.	1,2,3	Project	Lecture presentation, Class discussion	[1],[2]

11,12,13	Nucleic acid: sources, classification, structure, properties, functions	1,2,3	Project	Lecture presentation, Class discussion	[1],[2]
14,15,16	Vitamins: sources, classification, structure, properties, functions	1,2,3	Project	Lecture presentation, Class discussion	[1],[2]
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
Project (30%)		x	x
Midterm exam (30%)	x	x	x
Final exam (40%)	x	x	x

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

5. Rubrics (optional)

1. Grading checklist

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

Criterion ...:			
Part 2..... (....%)			
Criterion 1 ...:			
Criterion ...:			
Part 3..... (....%)			
Criterion 1....:			
Criterion ...:			
Part (....%)			
TOTAL SCORE	100		

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some

			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 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

Organizational	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the 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 appropriate reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Biochemistry 2

Course Code: **BTBC211IU**

1. General information

Course designation	<i>This course is designed to provide the basic understanding of metabolic pathways with emphasis on the reactions, bioenergetics, regulation and disease relevance.</i>					
Semester(s) in which the course is taught	2					
Person responsible for the course	Dr. Vũ Thanh Ngọc					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, in-class quiz, discussion, writing assignment, presentation.					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	None					
Course objectives	This course is designed to provide the basic understanding of metabolic pathways with emphasis on the reactions, bioenergetics, regulation and disease relevance.					
Course learning outcomes	Upon the successful completion of this course students will be able to:					
	Competency level	Course learning outcome (CLO)				

	Knowledge	CLO1. Understand the reactions, bioenergetics and regulation of different metabolic pathways.	
	Skill	CLO2. Propose the approach to study metabolic pathway, predict the outcome of metabolic homeostasis disturbance and solution for certain metabolic abnormality. CLO3. Compose a mini-review, present and discuss about a topic related to metabolic pathways.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to metabolism	1	I, T, U
	Principles of bioenergetics, glycolysis, gluconeogenesis, pentose phosphate pathways	2	I, T, U
	Principle of metabolic regulation, fatty acid catabolism, citric acid cycle, fatty acid oxidation	3	I, T, U
	Amino acid oxidation and urea cycle	2	I, T, U
	Oxidative phosphorylation	2	I, T, U
	Carbohydrate biosynthesis, lipid biosynthesis, biosynthesis of amino acids, nucleotides	3	I, T, U
	Integration of metabolism	2	I, T, U
Examination forms	Multiple-choice, true/false, matching, short-answer questions, essay		
Study and examination requirements	<i>Requirements for successfully passing the module</i> 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	<i>[1] Voet, Voet and Pratt, Fundamentals of Biochemistry, Third Edition, Wiley, 2008</i> <i>[2] Lehninger: Principles in Biochemistry, 5th edition, 2008.</i>		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILO							
	1	2	3	4	5	6	7	8
1			L					
2		H						
3								H

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to metabolism	1, 2, 3	In-class quiz	Lecture, Discussion, In-class quiz	1, 2
2, 3	Principles of bioenergetics, glycolysis, gluconeogenesis, pentose phosphate pathways	1, 2, 3	In-class quiz	Lecture, Discussion, In-class quiz	1, 2
4-6	Principle of metabolic regulation, fatty acid catabolism, citric acid cycle, fatty acid oxidation	1, 2, 3	In-class quiz	Lecture, Discussion, In-class quiz	1, 2
7, 8	Amino acid oxidation and urea cycle	1, 2, 3	In-class quiz	Lecture, Discussion, In-class quiz	1, 2
9	Midterm				
10, 11	Oxidative phosphorylation	1, 2, 3	In-class quiz	Lecture, Discussion, In-class quiz	1, 2
12-14	Carbohydrate biosynthesis, lipid biosynthesis, biosynthesis of amino acids, nucleotides	1, 2, 3	In-class quiz	Lecture, Discussion, In-class quiz	1, 2
15, 16	Integration of metabolism	1, 2, 3	Writing assignment, Presentation	Lecture, Discussion, Presentation	1, 2
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class quizzes/Writing Assignment/Presentation (30%)			50%Pass

Midterm exam (30%)	50%Pass	50%Pass	
Final exam (40%)	50%Pass	50%Pass	

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

5. Rubrics (optional)

1. Grading checklist

Grading checklist for Writing Assignment			
Student:	HW/Assignment:		
Date:	Evaluator:		
	Max.	Score	Comments
Content (70%)			
Summary clearly summarizes principal content	10		
Each chapter demonstrates complete knowledge of relevant issues (Hollistic rubrics)	60		
Organization (10%)			
Distinct summary and main chapters	5		
Content clearly and logically organized, good transitions	5		
Presentation (10%)			
Correct spelling, grammar, and syntax	5		
Clear and easy to read	5		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

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.

Holistic rubric for evaluating the content of writing assignment	
Score	Description
5	Chapter demonstrates complete knowledge of relevant issues
4	Chapter demonstrates considerable knowledge of relevant issues
3	Chapter demonstrates partial knowledge of relevant issues
2	Chapter demonstrates little knowledge of relevant issues
1	Chapter demonstrates no knowledge of relevant issues
0	Task not attempted

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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	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

6. Date revised: May 12, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Biochemistry 2 Lab

Course Code: **BTBC212IU**

1. General information

Course designation	<i>This course is designed to build proficiency in laboratory techniques and give hands-on experience of concepts related to Biochemistry course.</i>					
Semester(s) in which the course is taught	2					
Person responsible for the course	Vũ Thanh Ngọc, PhD					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Instruction, discussion, in-class quiz, performing experiments, laboratory report assignment					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	0	2		
	Contact hours	50	0	50		
	Self-Study hours	60	0	60		
	Total workload	110	0	110		
Credit points	2 credits (4.00 ECTS)					
Required and recommended prerequisites for joining the course	None					

Course objectives	This course is designed to build proficiency in laboratory techniques and give hands-on experience of concepts related to Biochemistry course.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Describe the principles and procedure of some analytical techniques/methods in biochemistry	
	Skill	CLO2. Apply analytical techniques/methods in biochemistry to evaluate enzyme activity or quantify certain molecules in biological samples/products. CLO3. Appropriately perform the experiments, analyze, interpret data and make proper conclusions about the experimental results.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: practice (5 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Orientations (Introduce the safety, regulation, apparatus in biochemistry field)	1	I, T
	Pipette Calibration	1	I, T, U
	Quantification of Reducing Sugars	1	I, T, U
	Hydrolysis of Starch by Salivary Amylase	1	I, T, U
	Quantification of Protein in Soy Bean	1	I, T, U
	Enzymatic Activity of Bromelain	1	I, T, U
	Cheese Production from Milk	1	I, T, U
	Quantification of Calcium in Powdered Milk	1	I, T, U
	Quantification of Ascorbic Acid in Fruits	1	I, T, U
	Determination of Total Phenol Content in Different Sorts Of Tea	1	I, T, U
Examination forms	Multiple-choice, true/false, matching, short-answer questions, laboratory practice and writing laboratory report		

Study and examination requirements	<i>Requirements for successfully passing the module</i> 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] Ninfa, A. J., Ballou, D. P., & Benore, M. (2009). <i>Fundamental laboratory approaches for biochemistry and biotechnology</i>. John Wiley & Sons. [2] Rover, M. R., Johnston, P. A., Lamsal, B. P., & Brown, R. C. (2013). Total water-soluble sugars quantification in bio-oil using the phenol–sulfuric acid assay. <i>Journal of Analytical and Applied Pyrolysis</i>, 104, 194-201. [3] Mishra, P. J., Ragunath, C., & Ramasubbu, N. (2002). The mechanism of salivary amylase hydrolysis: Role of residues at subsite S2'. <i>Biochemical and biophysical research communications</i>, 292(2), 468-473. [4] Gautam, S. S., Mishra, S. K., Dash, V., Goyal, A. K., & Rath, G. (2010). Comparative study of extraction, purification and estimation of bromelain from stem and fruit of pineapple plant. <i>Thai Journal of Pharmaceutical Sciences</i>, 34(2). [5] Aleandri, R., Schneider, J. C., & Buttazzoni, L. G. (1989). Evaluation of milk for cheese production based on milk characteristics and Formagraph measures. <i>Journal of Dairy Science</i>, 72(8), 1967-1975. [6] Wu, D., Nie, P., He, Y., & Bao, Y. (2012). Determination of calcium content in powdered milk using near and mid-infrared spectroscopy with variable selection and chemometrics. <i>Food and Bioprocess Technology</i>, 5(4), 1402-1410. [7] Al-Ani, M., Opara, L. U., Al-Bahri, D., & Al-Rahbi, N. (2007). Spectrophotometric quantification of ascorbic acid contents of fruit and vegetables using the 2, 4-dinitrophenylhydrazine method. <i>Journal of Food Agriculture and Environment</i>, 5(3/4), 165. [8] Wang, H., Provan, G. J., & Helliwell, K. (2000). Tea flavonoids: their functions, utilisation and analysis. <i>Trends in Food Science & Technology</i>, 11(4-5), 152-160.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILO							
	1	2	3	4	5	6	7	8
1			L					

2		M						
3				H				

3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessments	Learning activities	Resources
1	Orientations (Introduce the safety/ regulation and equipment/machines in biochemistry field)	1, 2, 3	In-class quiz	Instruction, discussion, performing experiments, data collection	1
2	Pipette Calibration	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	2
3	Quantification of Soluble Carbohydrate	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	2
4	Hydrolysis of Starch by Salivary Amylase	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	3
5	Quantification of Protein in Soy Bean	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	1, 4
7	Midterm				
6	Enzymatic Activity of Bromelain	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	4
8	Cheese Production from Milk	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	5
9	Quantification of Calcium in Powdered Milk	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing	6

				experiments, data collection	
10	Quantification of Ascorbic Acid in Fruits	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	7
11	Determination of Total Phenol Content in Different Sorts Of Tea	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	8
12	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class quizzes/Lab Performance/Written Lab Report (60%)	50%Pass		60%Pass
Midterm exam (20%)	50%Pass	50%Pass	
Final exam (20%)	50%Pass	50%Pass	

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

5. Rubrics (optional)

1. Grading checklist

Grading checklist for Written Reports			
Student:	HW/Assignment:		
Date:	Evaluator:		
	Max.	Score	Comments
Technical content (70%)			
Abstract clearly identifies purpose and summarizes principal content	5		

Introduction demonstrates good knowledge of general background and clearly summarizes the aims/objectives of the experiment	5		
All materials and methods are listed and appropriate	5		
Results are appropriate; analysis and discussion demonstrates good subject mastery	50		
Conclusions are appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
Presentation (10%)			
Correct spelling, grammar, and syntax	5		
Clear and easy to read	5		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

2. Holistic rubric

Holistic rubric for evaluating the entire document and quizzes	
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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

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

6. Date revised: May 12, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

for joining the course										
Course objectives	On completion of this course, students will be able to: 1) Describe microbial cell structures and their physiological functions and associate this knowledge with drug/vaccine designs 2) Differentiate different types of media used for microbial cultures and major processes of microbial metabolisms 3) Explain the principles of the common methods used for microbial growth measurements and evaluate the advantage(s) and disadvantage(s) of each method 4) Illustrate gene structures, genetic flows and regulations in microorganisms; Describe possible approaches for microbial genetic manipulations 5) Differentiate viruses, algae, fungi and protozoa from each other and explain the methods used for their classification, then, describe their potential/actual applications based on their major characteristics including cell structures, distribution, modes of nutrition, ect. 6) Analyze the roles of microorganisms in ecosystems and describe their applications in bioremediation (wastewater treatment, bioleaching ores) 7) Categorize microbial flora in humans into different groups and propose how to control or maintain a normal human microbial flora 8) Assess the applications of microorganisms in different fields including agriculture, food industry, and environmental management and design procedure for producing a microbial product of interest									
Course learning outcomes	Upon the successful completion of this course students will be able to: <table><tr><td>Competency level</td><td>Course learning outcome (CLO)</td></tr><tr><td>Knowledge</td><td>CLO1. Describing important characteristics of different groups of microorganisms CLO2. Acquiring and mastering microbial culture techniques and analyzing the applications of microbes in different fields</td></tr><tr><td>Skill</td><td>CLO3. Mastering communication, and teamwork and problem-solving skills</td></tr><tr><td>Attitude</td><td>CLO4. Applying safety and ethical practices</td></tr></table>		Competency level	Course learning outcome (CLO)	Knowledge	CLO1. Describing important characteristics of different groups of microorganisms CLO2. Acquiring and mastering microbial culture techniques and analyzing the applications of microbes in different fields	Skill	CLO3. Mastering communication, and teamwork and problem-solving skills	Attitude	CLO4. Applying safety and ethical practices
Competency level	Course learning outcome (CLO)									
Knowledge	CLO1. Describing important characteristics of different groups of microorganisms CLO2. Acquiring and mastering microbial culture techniques and analyzing the applications of microbes in different fields									
Skill	CLO3. Mastering communication, and teamwork and problem-solving skills									
Attitude	CLO4. Applying safety and ethical practices									

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Course outline, and overview of microbial life	1.5	I, T
	Cell structure and function in Bacteria and Archaea	2.0	I, T
	Nutrition, laboratory culture, and metabolism of microorganisms	1.5	I, T
	Microbial growth Revision for midterm exam	2.0	T, U
	Midterm exam		
	Bacterial genetics	1.5	
	Eukaryotic microorganism and viruses	3	T, U
	Microbial Ecology	1	T, U
	Human microbial flora	0.5	T, U
	Industrial Microbiology Revision for final exam	2	T, U
	Final Exam		
Examination forms	Written exam, presentation, and report		
Study and examination requirements	Attendance: A minimum attendance of 80 percent of the class sessions is compulsory. Student participation will be assessed on a regular basis. Questions and comments are strongly encouraged. Assignments/Examination: Students must obtain at least 50/100 points in total to pass this course.		
Reading list	Textbooks 1. Madigan, M.T., Martinko, J.M., Dunlap, P.V., Clark, D.P. (2005). Brock Biology of Microorganisms, 11th Ed, Benjamin Cummings. Article References 0. To be provided (Note: Articles will be updated every year) Other 0. YouTube channel: https://www.youtube.com/channel/UCoZgEu3kaRDan1Mvf5l6EcQ		

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

CLO	ILOs							
	1	2	3	4	5	6	7	8
1	L							
2		M						
3								M
4					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Course outline, and overview of microbial life	1	Quizzes	Lecture, Discussion, In-class Quiz	1,3
2	Cell structure and function in Bacteria and Archaea	1	Quizzes	Lecture, Discussion, In-class-Quiz	1,3
3	Nutrition, laboratory culture, and metabolism of microorganisms	1	Quizzes	Lecture, Discussion, In-class Quiz	1
4	Microbial growth	1	Quizzes	Lecture, Discussion, In-class Quiz	1,3
5	Lecture 5: Bacterial genetics And revision for midterm exam	1,2	Quizzes	Lecture, Discussion, In-class Quiz	1
9	Midterm				
10	Eukaryotic microorganism and viruses	1,2	Quizzes	Lecture, Discussion, In-class Quiz	1
11	Microbial Ecology	1,2	Quizzes	Lecture, Discussion, In-class Quiz	1
12	Human microbial flora	1,2	Quizzes	Lecture, Discussion, In-class Quiz	1
13	Industrial Microbiology And revision for final exam	1,2	Quizzes	Lecture, Discussion, In-class Quiz	1,2

17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Assignment (30%)			P/R 90%Pass	
Midterm exam (30%)	Q 70%Pass	Q 70%Pass		
Final exam (40%)		Q 70%Pass		Q 70%Pass

Note: %Pass: % of students having scores equal to or greater than 50% out of the total score(s)

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology

COURSE SYLLABUS

Course Name: Practice in Microbiology

Course Code: BT322IU

1. General information

Course designation	This course is designed for undergraduate students to acquire basic knowledge and techniques in microbiology research. Students will be introduced and practice with basic techniques and procedures such as media preparation; aseptic and sub-culturing technique; setup conditions for microbial growth; Gram staining and analysis using microscope, as well as bacterial enumeration. In addition, students will be also engaged partially with the process of characterizing an unknown microbial species.					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	Assoc. Prof. Tran Thi My Hanh Dr. Tran Thi Hai Yen MBT. Hoang Thi Lan Xuan					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, Discussion, Practice					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	0	1		
Contact hours	25		0	25		
Self-Study hours	30		0	30		
Total workload	55		0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	Prerequisite: Biology (BT311IU), Microbiology (BT321IU, completed or enrolling in parallel)					

Course objectives	• Providing learners fundamental knowledge in culturing, working and analyzing microorganisms • Familiarizing learners with media preparation; culturing condition, bacterial cell enumeration, aseptic technique and Gram staining procedure, preparation of bacterial slides and general observation of bacterial cells and colonies.	
Course learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	Course learning outcome (CLO)
	Knowledge	CLO1. Learn considerations in culturing a microorganism of interest and care of microbial culture CLO2. Understand principles of basic techniques and procedures in the field of microbiology, such as medium preparation; aseptic and culture techniques, Gram staining, serial dilution, standard plate count, analyzing characters of microorganisms based on growth display on various medium, oxygen demand, temperature effects and biochemical tests.
	Skill	CLO3. Know how to prepare relevant culturing medium for microorganisms, sterilize medium and storing medium CLO4. Perform aseptic technique and culture technique using liquid and solid media CLO5. Perform Gram staining and wet mount slide preparation, observe and analyze morphology of cells under microscope CLO6. Classify a microorganism into a group based on oxygen effect and temperature range for growth and how to care stock cultures CLO7. Perform standard plate count method to enumerate viable cells in a particular bacterial culture CLO8. Characterize unknown bacteria based on growth on blood agar, MacConkey agar and catalase test
	Attitude	CLO9. Seriousness and care regarding safety issues when working with microorganisms - how to protect samples, protect workers and protect the environment.

Content	<i>The description of the contents should clearly indicate the weighing of the content and the level.</i> Weight: lecture session (5 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Laboratory 1: Allocation of laboratory place; Introduction to the course; Medium preparation	1	I, T, U
	Laboratory 2: Aseptic technique; Culture technique; subculture	1	I, T, U
	Laboratory 3: Use of the microscope; wet mount preparation; smear preparation; Gram staining	1	I, T, U
	Laboratory 4: Effects of different factors on microbial growth; preparation and care of stock culture	1	I, T, U
	Laboratory 5: Bacterial population counts	1	I, T, U
	Laboratory 6: Introduction to Bacterial identification process and Exam	1	I, T, U
Examination forms	Lab reports; exam		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	[1] Laboratory Manual for Microbiology Practical class, School of Biotechnology, International University [Internal Use]		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-9) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1							M	
2	M							
3				M				
4				M				
5				M				
6				M				
7				M				
8				L				

9					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Laboratory 1: + Allocation of laboratory place + Introduction to the course + Medium preparation	1,2,9	Progress, Report	Lecture, Discussion, Practice	[1]
2	Laboratory 2: + Aseptic technique + Culture technique + Subculture	1,2,3,4,9	Progress, Report	Lecture, Discussion, Practice	[1]
3	Laboratory 3: + Use of the microscope + Wet mount preparation + Smear preparation + Gram staining	2,4,5,9	Progress, Report	Lecture, Discussion, Practice	[1]
4	Laboratory 4: + Effects of different factors on microbial growth + preparation and care of stock culture	2,4,6,9	Progress, Report	Lecture, Discussion, Practice	[1]
5	Laboratory 5 + Bacterial population counts	2,4,7,9	Progress, Report	Lecture, Discussion, Practice	[1]
6	Laboratory 6 + Introduction to Bacterial identification process and Exam	2,4,8,9	Progress, Exam	Lecture, Discussion, Practice, Exam	[1]

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9

Lab report (70%)	Report 1 75% pass	Reports 1-5 75% pass	Report 1 75% pass	Report 2 75% pass	Report 3 75% pass	Report 4 75% pass	Report 5 75% pass		Reports 1-5, 75% pass
Exam (30%)								Exam results 75% pass	Exam performance 75% pass

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

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

Course Name: Molecular Cell Biology

1. General information

Course designation	<i>This course is designed with emphasis on the structure of cells and its constituents as well as basic molecular cell mechanisms and their regulation. Some molecular genetic techniques are also introduced in the course.</i>						
Semester(s) in which the course is taught	2						
Person responsible for the course	Dr. Vũ Thanh Ngọc						
Language	English						
Relation to curriculum	Compulsory						
Teaching methods	Lecture, in-class quiz, discussion, writing assignment, presentation.						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	3				
	Contact hours	37.5	37.5	0			
	Self-Study hours	90	90	0			
	Total workload	127.5	127.5	0			
Credit points	3 credits (4.62 ECTS)						
Required and recommended prerequisites for joining the course	None						
Course objectives	This course is designed with emphasis on the structure of cells and its constituents as well as basic molecular cell mechanisms and their regulation. Some molecular genetic techniques are also introduced in the course.						

Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Describe the structure of the cells and its constituents as well as basic molecular cell mechanisms and their regulation.	
	Skill	CLO2. Propose solutions for problems related to molecular cell biology CLO3. Compose a mini-review and discuss about a topic in molecular cell biology	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Protein, Nucleic Acid and Chromosome Structure	1	I, T, U
	DNA Replication, Mutation, Repair and Recombination	1	I, T, U
	Transcription, RNA Processing and Translation	1	I, T, U
	Regulation of Gene Expression	1	I, T, U
	Molecular Genetic Techniques and Genomics	2	I, T, U
	Biomembranes and Cell Architecture	1	I, T, U
	Integrating Cells into Tissues	1	I, T, U
	Transport Across Cell Membrane	1	I, T, U
	Vesicular Traffic, Secretion and Endocytosis	1	I, T, U
	Signal transduction	1	I, T, U
	Cytoskeleton and Cell Movement	1	I, T, U
	Cell Cycle, Regulation of Eukaryotic Cell Cycle	1	I, T, U
	Cell Birth, Lineage, Death and Its Regulation	1	I, T, U
	Cancer	1	I, T, U
	Examination forms	Multiple-choice, true/false, matching, short-answer questions, essay	

Study and examination requirements	<i>Requirements for successfully passing the module</i> 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] Harvey Lodish, Arnold Berk, Chris A. Kaiser, Monty Krieger, Anthony Bretscher, Hidde Ploegh, Kelsey C. Martin, Michael Yaffe, Angelika Amon, 2021. <i>Molecular Cell Biology</i>, 9th Edition. [2] Bruce Alberts, 2015. <i>Molecular biology of the cell</i>, 6th Edition. [3] Selected research and review articles related to the topics.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2		H						
3								H

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Protein, Nucleic Acid and Chromosome Structure	1, 2		Lecture, Discussion	[1], [2]
2	DNA Replication, Mutation, Repair and Recombination	1, 2, 3	Quiz/Assignment	Lecture, Discussion	[1], [2]
3	Transcription, RNA Processing and Translation	1, 2, 3	Quiz/Assignment	Lecture, Discussion	[1], [2]
4	Regulation of Gene Expression	1, 2, 3	Quiz/Assignment	Lecture, Discussion	[1], [2]
5, 6	Molecular Genetic Techniques and Genomics	1, 2		Lecture, Discussion	[1], [2]
7	Biomembranes and Cell Architecture	1, 2		Lecture, Discussion	[1], [2]
8	Integrating Cells into Tissues	1,2		Lecture, Discussion	[1], [2]
9	Midterm				

10	Transport Across Cell Membrane	1, 2		Lecture, Discussion	[1], [2]
11	Vesicular Traffic, Secretion and Endocytosis	1,2, 3	Quiz/Assignment	Lecture, Discussion	[1], [2]
12	Signal transduction	1, 2, 3	Quiz/Assignment	Lecture, Discussion	[1], [2]
13	Cytoskeleton and Cell Movement	1, 2, 3	Quiz/Assignment	Lecture, Discussion	[1], [2]
14	Cell Cycle, Regulation of Eukaryotic Cell Cycle	1, 2, 3	Quiz/Assignment	Lecture, Discussion	[1], [2]
15	Cell Birth, Lineage, Death and Its Regulation	1, 2, 3	Quiz/Assignment	Lecture, Discussion	[1], [2], [3]
16	Cancer	2, 3	Assignment/Presentation	Lecture, Discussion, Group work	[1],[2],[3]
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class quizzes/Writing Assignment/Presentation (30%)			60%Pass
Midterm exam (30%)	50%Pass	50%Pass	
Final exam (40%)	50%Pass	50%Pass	

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

5. Rubrics (optional)

1. Grading checklist

Grading checklist for Writing Assignment			
Student:	HW/Assignment:		
Date:	Evaluator:		
	Max.	Score	Comments
Content (70%)			
Summary clearly summarizes principal content	10		
Each chapter demonstrates complete knowledge of relevant issues (Hollistic rubrics)	60		

Organization (10%)			
Distinct summary and main chapters	5		
Content clearly and logically organized, good transitions	5		
Presentation (10%)			
Correct spelling, grammar, and syntax	5		
Clear and easy to read	5		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

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.

Holistic rubric for evaluating the content of writing assignment	
Score	Description
5	Chapter demonstrates complete knowledge of relevant issues
4	Chapter demonstrates considerable knowledge of relevant issues
3	Chapter demonstrates partial knowledge of relevant issues
2	Chapter demonstrates little knowledge of relevant issues
1	Chapter demonstrates no knowledge of relevant issues
0	Task not attempted

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

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

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the	Language choices are thoughtful and generally support the effectiveness of the	Language choices are mundane and commonplace and partially support the effectiveness	Language choices are unclear and minimally support the effectiveness of the presentation.

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

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Molecular Cell Biology Lab

Course Code: BTBC219IU

1. General information

Course designation	<i>This course is designed to build proficiency in laboratory techniques and give hands-on experience of concepts related to Molecular Cell Biology course.</i>				
Semester(s) in which the course is taught	6				
Person responsible for the course	Vũ Thanh Ngọc, PhD				
Language	English				
Relation to curriculum	Compulsory				
Teaching methods	Instruction, discussion, in-class quiz, performing experiments, laboratory report assignment				
Workload (incl. contact hours, self-study hours)		Lecture	Lab		
		<i>Credit</i>	0	1	
	Contact hours	25	0	25	
	Self-Study hours	30	0	30	
	Total workload	55	0	55	
Credit points	1 credit (2.00 ECTS)				
Required and recommended prerequisites for joining the course	Biology Methods in Biochemistry				

Course objectives	This course is designed to build proficiency in laboratory techniques and give hands-on experience of concepts related to Molecular Cell Biology course.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand basic knowledge regarding bacterial growth, biofilm formation, molecular cloning and recombinant protein expression.	
	Skill	CLO2. Identify and propose solutions for problems emerged from the practice regarding bacterial growth, biofilm formation, molecular cloning and recombinant protein expression. CLO3. Appropriately perform the experiments, analyze, interpret data and make proper conclusions about the experimental results.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: practice (5 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction of the laboratory safety/regulation and common equipment/apparatus in molecular cell biology. Inhibition of bacterial growth and biofilm formation	1	I, T, U
	Generation of expression system	3	I, T, U
	Recombinant protein expression	2	I, T, U
Examination forms	Multiple-choice, true/false, matching, short-answer questions, laboratory practice and writing laboratory report		
Study and examination requirements	<i>Requirements for successfully passing the module</i> Attendance: Attendance of 100 percent is compulsory for the laboratory sessions. Students will be assessed on the basis of their participation. Assignments/Examination: Students must have at least 50/100 points overall to pass this course.		

Reading list	1. Aigal, Irfan M, Khan P, Abid M, Khan MM. <i>Design, Synthesis, and Biological Evaluation of Novel Fused Spiro-4H-Pyran Derivatives as Bacterial Biofilm Disruptor</i>. ACS Omega. 2019 Sep 30;4(16):16794-16807. doi: 10.1021/acsomega.9b01571. 2. Sambrook J. <i>Molecular Cloning: A Laboratory Manual, Third Edition</i>. 3rd edition ed. Cold Spring Harbor, N.Y: Cold Spring Harbor Laboratory Press; 2001 2001/01/15/. 2344 p. 3. <i>Current protocols in molecular biology</i>, edited by M. Ausubel, R. Brent, R.E. Kingston, D.D. Moore, J.G. Seidman, J.A. Smith, and K. Struhl. Volumes 1 and 2. John Wiley & Sons, Inc., Media, PA, 1988, Mol Reprod Dev. 1989

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1 -11) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2		H						
3				H				

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction of the laboratory safety/regulation and common equipment/apparatus in molecular cell biology. Inhibition of bacterial growth and biofilm formation	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	1
2, 3, 4	Generation of expression system	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	2, 3
5, 6	Recombinant protein expression	1, 2, 3	In-class quiz, lab performance, lab report	Instruction, discussion, performing experiments, data collection	2, 3
7	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class quizzes/Lab Performance/Written Lab Report (70%)			x
Final exam (30%)	x	x	

Note: Target that at least 70% of students having scores at least 50 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student:		HW/Assignment:	
Date:		Evaluator:	
	Max.	Score	Comments
Technical content (70%)			
Abstract clearly identifies purpose and summarizes principal content	5		
Introduction demonstrates good knowledge of general background and clearly summarizes the aims/objectives of the experiment	5		
All materials and methods are listed and appropriate	5		
Results are appropriate; analysis and discussion demonstrates good subject mastery	50		
Conclusions are appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
Presentation (10%)			
Correct spelling, grammar, and syntax	5		
Clear and easy to read	5		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

5.2. Holistic rubric

Holistic rubric for evaluating the entire document and quizzes	
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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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

	presenting a position.		assumptions 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

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Bioinformatics

Course Code: BT337IU

1. General information

Course designation	The basics of bioinformatics are explained, followed by discussions of the state-of-the-art computational tools available to solve biological research problems. All key areas of bioinformatics are covered including biological databases, next-generation sequencing, sequence alignment, gene and promoter prediction, molecular phylogenetics, structural bioinformatics, genomics and proteomics. Some applications of bioinformatics in drug design will be introduced at the end of the course				
Semester(s) in which the course is taught	1 & 2				
Person responsible for the course	Dr. Nguyen Minh Thanh				
Language	English				
Relation to curriculum	Elective				
Teaching methods	Lecture, assignment, project, seminar.				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	3		
Contact hours	37.5		37.5	0	
Self-Study hours	90		90	0	
Total workload	127.5		127.5	0	
Credit points	3 credits (4.62 ECTS)				
Required and recommended prerequisites for joining the course	None				

Course objectives	The course provides a broad introduction to the entire field of bioinformatics and is specifically designed for students majoring in biological chemistry & biotechnology.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand basic knowledge of bioinformatics: definitions and concepts, perspectives of biological macromolecules, bioinformatics tools. CLO2. Understand emerging technology including next-generation sequencing, DNA microarray, in silico drug design, nanoparticulate drug delivery systems.	
	Skill	CLO3. Use online database and bioinformatic tools CLO4. Apply the methods to determine functional genes of interest, to simulate biological pathways for drug development	
	Attitude	CLO5. Analyze the roles of bioinformatics in many fields of science and life and highlight how this knowledge can be applied to addressing problems in society.	
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 Bioinformatics	1	I
	Sequencing technologies for data generation	1	I, T
	Online biological databases	1	T, U
	Database searching	1	T, U
	Sequence alignment	1	T, U
	Revealing genome features	1	T, U
	Phylogenetic analysis	2	T, U
	Protein analysis & proteomics	1	I, T
	Protein structure	1	T, U
	Gene expression analysis	1	T, U
	Systems biology	1	T, U
	Genome-wide association study	1	I, T
Application of bioinformatics	2	I, T, U	
Examination forms	Multiple-choice questions, short-answer questions, true-false questions, matching questions, fill-in questions, web-based tools 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	- Jonathan Pevsnet, J., 2015. Bioinformatics and Functional Genomics, 3rd edition. Wiley Blackwell. - Choudhuri, S., 2014. Bioinformatics for Beginners: Genes, Genomes, Molecular Evolution, Databases & Analytical Tools. Elsevier Inc. - Lesk. A.M. 2014. Introduction to Bioinformatics, 4th edition. Oxford University Press. - Zvelebil, M., Zvelebil, M.J., Baum, J.O., 2008. Understanding Bioinformatics. Garland Science.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	L	L						
2			L	L				
3			M			M		
4		M				M		
5					H			H

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Bioinformatics	1		Lecture, homework	[1], [3]
2	Sequencing technologies for data generation	1, 2		Lecture, homework	[1], [2]
3	Online biological databases	1, 3	Assignment 1	Lecture, homework	[1], [2]
4	Database searching	1, 3	Assignment 2	Lecture, homework	[1], [2]
5	Sequence alignment	1, 3	Assignment 3	Lecture, homework	[1], [2]
6	Revealing genome features	1, 3	Assignment 4	Lecture, homework	[1], [2]

7&8	Phylogenetic analysis	1, 3	Assignment 5	Lecture, homework	[1], [2]
9-10	Midterm exam				
11	Protein analysis & proteomics	2, 3, 4		Lecture, Discussion	[1], [2]
12	Protein structure	2, 3, 4	Assignment 6	Lecture, homework	[1], [2]
13	Gene expression analysis	2, 3, 4		Lecture, Discussion	[1], [2]
14	Systems biology	2, 3, 4		Lecture, Discussion	[4]
15	Genome-wide association study	1, 4		Lecture, Discussion	[1], [3]
16&17	Application of bioinformatics	5	Presentation	Seminar, Group work	Others
19-20	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Assignment, presentation (30%)	Assignment 1, 2, 3, 4, 5 60% Pass	Assignment 6 60% Pass	Assignment 1, 2, 3, 4, 5 60% Pass	Assignment 6 60% Pass	Presentation 60% Pass
Midterm exam (30%)	X 60 %Pass	X 60 %Pass	X 60 %Pass		
Final exam (40%)		X 60 %Pass	X 60 %Pass	X 60 %Pass	X 60 %Pass

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

5. Date revised: June, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Practice in Bioinformatics

Course Code: BT338IU

1. General information

Course designation	<i>The course will introduce students to different environments of bioinformatic tools. Students will gain the knowledge in knowing different versions of tools, installing Windows-supported tools, reading the manual to use the tool.</i>					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	MSc. Do Ngoc Phuc Chau					
Language	English					
Relation to curriculum	compulsory, fundamental					
Teaching methods	Lecture, lab works, project, lab exam					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		Credit	0	1		
Contact hours	25		0	25		
Self-Study hours	30		0	30		
Total workload	55		0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	Bioinformatics					
Course objectives	<i>The content is built to get students knowing the post-process of sequencing, conduct the experiment with sequencing reads and first joining to the protein simulation with modeling the structure of protein.</i>					

Course learning outcomes	Upon the successful completion of this course students will be able to:			
	Competency level	Course learning outcome (CLO)		
	Knowledge	CLO1. Know different types of bioinformatic tools CLO2. Install and understand the manual of specific tool		
	Skill	CLO3. Apply different tools on different data sets for specific information CLO4. Analyze and interpret results obtained from different tools		
	Attitude	CLO5. An ability to obtain relevant knowledge of ethical as well as the associated plagiarism issue		
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (5 hours) Teaching levels: L (Lecture); D (Demonstrate); U (Utilize)			
	Week	Topics	Weight	Level
	1	Introduction - Introduce main databases, basic tools and file formats using in the course - Search for information from the databases, install or register for the tools, construct specific file format	1	L, D, U
	2	Galaxy platform (1) - Understand the fastq format - Read and understand the report of quality control for sequencing results	1	L, D, U
	3	Galaxy platform (2) - Map the sequencing reads on the reference genome - Call the variants of the experienced genome from reference genome - Read the result	1	L, D, U
	4	VMD tool - Select and install the suitable version for special computer - Use the VMD to illustrate and compare the 3D structure of proteins	1	L, D, U
	5	Modeller tool - Select and install the suitable version for special computer - Conduct the command line to work with unknown-structure protein - Check the quality of modeled protein	1	L, D, U
	6	Group project - Group presentation	1	U

Examination forms	- Lab reports - Written report and presentation for Group project on specific organism: calling variants and modeling unknown-structure protein
Study and examination requirements	- Attendance: A full attendance of 100% is compulsory for the class sessions. Students will be assessed based on their participation. Questions and comments are strongly encouraged. - Students must get more than 50/100 points overall to pass this module.
Reading list	1. Tutorials for Galaxy platform: https://training.galaxyproject.org/training-material/ 2. Tutorials for VMD usage: http://www.ks.uiuc.edu/Training/Tutorials/ 3. Tutorials for Modeller: https://salilab.org/modeller/tutorial/

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	L							
2	M							
3				M				
4				M				
5					M		H	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction	1, 4	Report 1	L, D, U	
2	Galaxy platform (1)	2, 3, 4	Report 2	L, D, U	1
3	Galaxy platform (2)	2, 3, 4	Report 3	L, D, U	1
4	VMD tool	2, 3, 4	Report 4	L, D, U	2
5	Modeler tool	2, 3, 4		L, D, U	3
6	Group project	4, 5	Project: Written and Presentation	U	

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5

Reports (50%)	Report 1 80%Pass	Report 2, 3, 4 80%Pass	Report 2, 3, 4 80%Pass	Report 1, 2, 3, 4 80%Pass	
Group project (50%)				Presentation 90%Pass	Presentation 90%Pass

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

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: **Enzymology**

Course Code: **BTBC315IU**

1. General information

Course designation	<i>On campus course</i>					
Semester(s) in which the course is taught	3					
Person responsible for the course	<i>Assoc. Prof. Nguyen Tan Khoi</i>					
Language	English					
Relation to curriculum	<i>Compulsory</i>					
Teaching methods	<i>lecture, lesson.</i>					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	Prerequisites: General biochemistry 2 Recommended previous courses: Organic Chemistry 1, Physical Chemistry and Biophysical Chemistry.					
Course objectives	- Provides students with knowledge on the structure and function of enzymes, with special reference to molecular mechanisms underlying the catalytic activity, and mechanisms of inhibition and modulation. - Provides introduction to some of the basic techniques for the extraction, purification and characterization of the enzymes.					

	Discussions on some typical enzymes are also introduced to students on this occasion.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	<table><tr><td>Competency level</td><td>Course learning outcome (CLO)</td></tr></table>	Competency level	Course learning outcome (CLO)
	Competency level	Course learning outcome (CLO)	
	<table><tr><td>Knowledge</td><td>CLO1. Understanding of concepts, key points of enzymology. CLO2. Able to distinguish different mechanisms of enzymatic processes.</td></tr></table>	Knowledge	CLO1. Understanding of concepts, key points of enzymology. CLO2. Able to distinguish different mechanisms of enzymatic processes.
	Knowledge	CLO1. Understanding of concepts, key points of enzymology. CLO2. Able to distinguish different mechanisms of enzymatic processes.	
<table><tr><td>Skill</td><td>CLO3. Know how to formulate and solve different kinetic models of enzymatic processes. CLO4. Know how to enzyme inhibition processes.</td></tr></table>	Skill	CLO3. Know how to formulate and solve different kinetic models of enzymatic processes. CLO4. Know how to enzyme inhibition processes.	
Skill	CLO3. Know how to formulate and solve different kinetic models of enzymatic processes. CLO4. Know how to enzyme inhibition processes.		
<table><tr><td>Attitude</td><td>CLO5. Able to solve practical problems and analyze the solutions.</td></tr></table>	Attitude	CLO5. Able to solve practical problems and analyze the solutions.	
Attitude	CLO5. Able to solve practical problems and analyze the solutions.		
Content	Lecture 1: Basic concepts (CLO1, CLO2) - Introduction to enzymes Catalytic power, specificity, regulation of enzyme activity, cofactors, classification of enzymes. Lecture 2: (CLO1, CLO3, CLO4) The EC naming system, isoenzymes, multienzyme systems. Lecture 3: Enzyme kinetics: (CLO1, CLO3, CLO4) Kinetic data and analyses, stability of the transition state, one-substrate reactions, two-substrate reactions, activation and inhibition of enzymes, factors affecting enzyme action, pre-steady state kinetics, techniques. Lecture 4: Structural aspects of enzymes (CLO1, CLO2, CLO3, CLO4) -Structure of enzyme -Determination of molecular weight, mass spectroscopy, Lecture 5: Structural aspects of enzymes, cont (CLO1, CLO2, CLO3, CLO4) - Determination of amino acid composition, determination of primary, secondary structures. Lecture 6: protein folding (CLO1, CLO2) Lecture 7, 8: Enzyme kinetics (CLO1, CLO2, CLO3) Kinetic data and analyses, stability of the transition state, one-substrate reactions Lecture 9, 10: Two-substrate reaction, activation and inhibition of enzymes, factors affecting enzyme action, pre-steady state kinetics, techniques.. (CLO1, CLO2) Lecture 11, 12: Enzyme regulation: (CLO1, CLO2, CLO4, CLO5) Specificity from Molecular Recognition, Controls over enzymatic activity, allosteric regulation of enzyme activity, allosteric model. Lecture 13: Enzymes in living things (CLO1, CLO2) Organized enzyme system, enzymes in the cell, localization pathways.		

	Lecture 14: Compartmentation of metabolic pathways, enzymes in membrane, multienzyme complex. (CLO1, CLO2, CLO5) Lecture 15: Introduction to typical enzymes Glutathione S-transferase, glutathione peroxidase, gamma glutamyl transpeptidase, hexokinase, phosphofructokinase, pyruvate dehydrogenase, malate dehydrogenase, succinate dehydrogenase, cytochrome P450, lysozyme, proteasome, NO synthase, DNA polymerase, glucose 6-phosphate dehydrogenase (CLO5)
Examination forms	<i>Written exams (Midterm+Final)</i>
Study and examination requirements	Students are expected to spend at least 8 hours per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that students may be refused to take final assessment if they attend less than 80% of scheduled classes. Regular attendance is essential for successful performance and learning in this course, particular in the view of the interactive teaching and learning approach adopted.
Reading list	Textbooks: Price, N.C. Fundamentals of enzymology: the cell and molecular biology of catalytic protein. 3rd edition. Oxford: Oxford University Press, 1999 References: Fersht, A. Structure and mechanism in protein science: A guide to enzyme catalysis and protein folding. W.H. Freeman and Co., 1998. Cornish-Bowden, A.C. Fundamentals of enzyme kinetics. Portland Press, 1995 Fell, D. Understanding the control of metabolism. Portland Press, 1997

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			M					
2			M					
3	M		M					
4	M		M			L		
5						H	M	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Basic concepts (CLO1, CLO2) - Introduction to enzymes Catalytic power, specificity, regulation of enzyme activity, cofactors, classification of enzymes	CLO1, CLO2	5%	- Lecture presentation - Group forming. - Class discussion - Read book & lecture 2.	
2	Lecture 2: The EC naming system, isoenzymes, multienzyme systems	CLO1, CLO3, CLO4	5%	- Lecture presentation - Class discussion - Read book & lecture 3.	
3	Lecture 3: Enzyme kinetics: (CLO1, CLO3, CLO4) Enzyme kinetics Kinetic data and analyses, stability of the transition state, one-substrate reactions, two-substrate reactions, activation and inhibition of enzymes, factors affecting enzyme action, pre-steady state kinetics, techniques.	CLO1, CLO3, CLO4	10%	- Lecture presentation - Class discussion - Read book & lecture 4.	
4	Lecture 4: Structural aspects of enzymes (CLO1, CLO2, CLO3, CLO4) -Structure of enzyme -Determination of molecular weight, mass spectroscopy,	CLO1, CLO2, CLO3, CLO4	10%	- Class discussion - Read book & lecture 5.	
5	Lecture 5: Structural aspects of enzymes, cont (CLO1, CLO2, CLO3, CLO4) - Determination of amino acid composition, determination of primary, secondary structures.	CLO1, CLO2	5%	- Lecture presentation - Class discussion - Read book & lecture 6.	
6	Lecture 6: protein folding	CLO1, CLO2	5%	-Lecture presentation - Class discussion - Read book & lecture 7	
7,8	Lecture 7, 8: Enzyme kinetics (CLO1, CLO2, CLO3)	CLO1, CLO2, CLO3	10%	Lecture presentation	

	Kinetic data and analyses, stability of the transition state, one-substrate reactions			- Class discussion - Read book & lecture 9	
9	Midterm				
10, 11	Lecture 9, 10: Two-substrate reaction, activation and inhibition of enzymes, factors affecting enzyme action, pre-steady state kinetics, techniques.	CLO1, CLO2	15%	- Lecture presentation - Class discussion - Read book & lecture 11.	
12, 13	Lecture 11, 12: Enzyme regulation: Specificity from Molecular Recognition, Controls over enzymatic activity, allosteric regulation of enzyme activity, allosteric model.	CLO1, CLO2, CLO4, CLO5	15%	- Lecture presentation - Class discussion - Read book & lecture 13.	
14	Lecture 13: Enzymes in living things. Organized enzyme system, enzymes in the cell, localization pathways.	CLO1, CLO2	10%	- Lecture presentation - Class discussion	
15	Lecture 14: Compartmentation of metabolic pathways, enzymes in membrane, multienzyme complex.	CLO1, CLO2, CLO5	10%	- Lecture presentation - Class discussion	
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Written exam (70%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Quiz (20%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Class participation (10%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass

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

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Enzymology Laboratory

Course Code: **BTBC316IU**

1. General information

Course designation	This course aims to - Provide students with knowledge on the structure and function of enzymes, with special reference to molecular mechanisms underlying the catalytic activity, and mechanisms of inhibition and modulation. - Provide introduction to some of the basic techniques for the extraction, purification and characterization of the enzymes. - Provide discussions on some typical enzymes				
Semester(s) in which the course is taught	1				
Person responsible for the course	MSc. Le Tran Hong Ngoc				
Language	English				
Relation to curriculum	Elective, Specialized				
Teaching methods	lab work				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	0	1	
	Contact hours	25	0	25	
	Self-Study hours	30	0	30	
	Total workload	55	0	55	
Credit points	1 credit (2.00 ECTS)				
Required and recommended prerequisites for joining the course	Biochemistry 2				
Course objectives	Students will be able to				

	- perform basic techniques for the extraction, purification and characterization of the enzymes. - identify conditions affecting enzyme activities																				
Course learning outcomes	Upon the successful completion of this course students will be able to:																				
	Competency level	Course learning outcome (CLO)																			
	Knowledge	CLO1. Understanding of concepts, structures, and functions of enzymes CLO2. Have knowledge of available methods for enzyme extraction, purification and application																			
	Skill	CLO3. Able to perform basic techniques for enzyme extraction, purification, and quantification and evaluate conditions affecting enzyme activities																			
	Attitude	CLO4. Develop critical thinking skills to be able to solve practical problems, analyze different situations, and combine various techniques in future research/industrial applications.																			
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>																				
	Weight: lab work (4 hours)																				
	Teaching Levels: I(Introduce); T (teach); U (Utilize)																				
	<table><tr><td>Topic</td><td>Weight</td><td>Level</td></tr><tr><td>Enzyme extraction from plant source</td><td>1</td><td>I, T, U</td></tr><tr><td>Biosynthesis of Enzymes from Fungi and Bacteria</td><td>1</td><td>I, T, U</td></tr><tr><td>Enzyme extraction from Bacteria</td><td>1</td><td>I, T, U</td></tr><tr><td>Effect of Enzyme Concentration on Enzyme Activity</td><td>1</td><td>I, T, U</td></tr><tr><td>Effect of Heat Stability on Enzyme Activity</td><td>1</td><td>I, T, U</td></tr></table>			Topic	Weight	Level	Enzyme extraction from plant source	1	I, T, U	Biosynthesis of Enzymes from Fungi and Bacteria	1	I, T, U	Enzyme extraction from Bacteria	1	I, T, U	Effect of Enzyme Concentration on Enzyme Activity	1	I, T, U	Effect of Heat Stability on Enzyme Activity	1	I, T, U
	Topic	Weight	Level																		
	Enzyme extraction from plant source	1	I, T, U																		
	Biosynthesis of Enzymes from Fungi and Bacteria	1	I, T, U																		
	Enzyme extraction from Bacteria	1	I, T, U																		
Effect of Enzyme Concentration on Enzyme Activity	1	I, T, U																			
Effect of Heat Stability on Enzyme Activity	1	I, T, U																			
Examination forms	Short answers, Multiple Choice Questions																				
Study and examination requirements	It is compulsory for all students to attend all class sessions. Failure to be present in any session without reason will immediately result in being dropped from the course. Students will be assessed on the basis of their class participation and lab techniques. Questions and comments are strongly encouraged.																				

Reading list	[1] Yon-Kahn, J. Hervé, G. Molecular and Cellular Enzymology. Springer-Verlag Berlin Heidelberg 2010 [2] Cornish-Bowden, A.C. Fundamentals of enzyme kinetics. Portland Press, 1995 [3] Department of Applied Chemistry - Enzymology Lab Manual.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1								
2		M						
3				M				
4						M		

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Course Chemical Preparation	1, 2, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo -Group forming. -Group discussion -Lab practice	[1], [2], [3]
2	Biosynthesis of Enzymes from Fungi and Bacteria	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo -Group forming. -Group discussion -Lab practice	[2], [3]
3	Enzyme extraction from Plants	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo	[2], [3]

				-Group forming. -Group discussion -Lab practice	
4	Effect of Enzyme Concentration on Enzyme Activity	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo -Group forming. -Group discussion -Lab practice	[1], [2], [3]
5	Effect of Heat Stability on Enzyme Activity	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo -Group forming. -Group discussion -Lab practice	[1], [2], [3]
6	Final exam		Short answer questions		

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class Quizzes (10%)	Qz1-3 60%Pass	Qz1-3 60%Pass	Qz4-5 60%Pass	Qz1-5 50%Pass
Lab Reports (40%)	Report 1-3 70%Pass	Report 1-3 70%Pass	Report 4-5 70%Pass	Report 1-5 60%Pass
Final Exam (50%)	90%Pass	90%Pass	90%Pass	90%Pass

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

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		

2. Analytic rubric

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
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 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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the 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 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 establishes the presenter's	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.	credibility/ authority on the topic.	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

6. Date revised: May 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

Course Name: Biopharmaceutics

1. General information

Course designation	This one-semester course is designed for Biochemistry students who are pursuing a Bachelor degree in Biochemistry towards medicine and pharmacy. The processes of absorption, distribution, metabolism, and excretion of drugs are introduced with the purpose of improving the evaluation of drug delivery systems, and the therapeutic management of patients. Additionally, the relevance to generic substitution of drugs is described. The course covered includes the physicochemical principles of pharmacy, such as acid-base theory, solubility, physical states of drugs, thermodynamics, drug stability, excipients, surfactants, dispersions, polymers, drug delivery, chemical compatibility and interactions of drugs in various dosage forms.						
Semester(s) in which the course is taught	1,2						
Person responsible for the course	Dr. Hoang Le Son						
Language	English						
Relation to curriculum	Specialization						
Teaching methods	lecture, lesson, project						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	3				
Contact hours	37.5	37.5	0				
Self-Study hours	90	90	0				
Total workload	127.5	127.5	0				
Credit points	3 credits (4.62 ECTS)						

Required and recommended prerequisites for joining the course	Organic chemistry 1 and Organic chemistry 2		
Course objectives	The Biopharmaceutics course will provide students the studying of factors influencing the dissolution of drug from dosage form into biological fluids at the site of absorption and the transfer of the dissolved drug across biomembrane into the systemic circulation.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand basic knowledge of the following: • The concepts of pharmacokinetics • Biochemical process of drugs • Concept of drug development • Drug delivery system	
	Skill	CLO2. Apply critical thinking and problem-solving skills of biochemistry in medicine and pharmacy	
	Attitude	CLO3. Predict and assess many aspects of everyday life using biopharmaceutics concepts.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to Biopharmaceutics	1	I, T
	Introduction to Pharmacokinetics Concept of adsorption, distribution, metabolism and elimination	2	I, T
	Introduction to Pharmacodynamics Drug action and drug interaction	1	I, T
Concepts of Drug Development	2	T, U	

	Biopharmaceutics Considerations in Drug Product Design	1	T, U
	Absorption and Availability Considerations	1	T, U
	Drug stability (types of decomposition, kinetics)	1	T, U
	Drug stability (dosage form/shelf life); rheology	1	T, U
	Surfactants and emulsifying agents; Disperse systems; Polymers and macromolecules	2	T, U
	Pharmaceutical solvents	1	T, U
	Physical/bulk characteristics of solids	1	T, U
	Ointment bases; Suppository bases	1	T, U
Examination forms	Multiple-choice questions, short-answer questions		
Study and examination requirements	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent, requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.		
Reading list	[1] Principles of Drug Action" by W.B. Pratt and P. Taylor (3rd edition). [2] AM Hillery, AW Lloyd, J Swarbrick. Drug Delivery and Targeting, Taylor and Francis, NY, NY.Biopharmaceutics (Phar 6164) [3] Alexander T. Florence; David Attwood ; Physicochemical Principles of Pharmacy, Fifth Edition Pharmaceutical Press, Royal Pharmaceutical Society, London, UK [4] Basic and Clinical Pharmacology” by B. G. Katzung, S. B. Masters and A.J. Trevors (11th edition, 2009). McGraw Hill		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-3) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILO							
	1	2	3	4	5	6	7	8
1			L					
2								M
3		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Biopharmaceutics	1		Lecture presentation, Group forming, Class discussion	[1],[2],[3],[4]
2,3	Introduction to Pharmacokinetics Concept of adsorption, distribution, metabolism and elimination	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
4	Introduction to Pharmacodynamics Drug action and drug interaction	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
5,6	Concepts of Drug Development	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
7	Biopharmaceutics Considerations in Drug Product Design	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
8	Absorption and Availability Considerations	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
9	Midterm exam				

10	Drug stability (types of decomposition, kinetics)	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
11	Drug stability (dosage form/shelf life); rheology	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
12,13	Surfactants and emulsifying agents; Disperse systems; Polymers and macromolecules	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
14	Pharmaceutical solvents	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
15	Physical/bulk characteristics of solids	1,2,3	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
16	Ointment bases; Suppository bases	1,2,3		Lecture presentation, Class discussion	[1],[2],[3],[4]
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Project (25%)		x	x
Midterm exam (25%)	x	x	x
Final exam (50%)	x	x	x

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Grading checklist

Grading checklist for Written Reports	
Student:	HW/Assignment:
.....	

Date:	Evaluator:		
.....			
	Max.	Score	Comments
Part 1..... (....%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion ...:			
Part 2..... (....%)			
Criterion 1 ...:			
Criterion ...:			
Part 3..... (....%)			
Criterion 1...:			
Criterion ...:			
Part (....%)			
TOTAL SCORE	100		

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable

	consistently observable and is skillful and makes the content of the presentation cohesive.	consistently observable within the presentation.	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the 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 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 establishes the presenter's	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.	credibility/ authority on the topic.	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

6. Date revised: May 18th, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

Course Name: Biophysical Chemistry

1. General information

Course designation	<i>On campus course</i>						
Semester(s) in which the course is taught	3						
Person responsible for the course	<i>Assoc. Prof. Nguyen Tan Khoi</i>						
Language	English						
Relation to curriculum	<i>Compulsory</i>						
Teaching methods	<i>lecture, lesson.</i>						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	3				
	Contact hours	37.5	37.5	0			
	Self-Study hours	90	90	0			
	Total workload	127.5	127.5	0			
Credit points	3 credits (4.62 ECTS)						
Required and recommended prerequisites for joining the course	Prerequisites: General biochemistry 2 Recommended previous courses: Organic Chemistry 1, Physical Chemistry and Biophysical Chemistry.						
Course objectives	• Organization. Biological macromolecules and the forces that stabilize them. • Biomacromolecules structure determination: X -ray and NMR • Intermolecular interactions: Protein-drug, protein-protein, protein-DNA, protein-RNA. • Thermodynamics of biomolecules: Entropy, enthalpy, free energy and equilibrium. • The reactions of the oxidase and reductases in biology.						

	• Macromolecules in solution: Gibbs-Duhem equation. Molal osmotic coefficients. Activity coefficients. Solute-solute interactions. • Macromolecules in solution: Hydrophobic interactions. Protein folding and unfolding. • Electrochemical equilibrium. Membrane potentials. Membrane biophysics. Dynamic structure of lipid bilayer membrane. • Ion channels and transporters. Ion pumps. Bioenergetics. • Respect different opinions • Understanding (of other's needs) • Active in finding solution for challenges or problems	
Course learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	Course learning outcome (CLO)
	Knowledge	CLO1. Understanding of concepts, key points of biophysical phenomena. CLO2. Be able to distinguish different mechanisms of biophysical phenomena.
	Skill	CLO3. Be able to break a biophysical phenomenon down into a mathematical model to quantify it. CLO4. How to set up an experiment to quantify biophysical phenomena.
	Attitude	CLO5. Able to solve practical problems and analyze the solutions.
Content	Lecture 1: (CLO1, CLO2) Organization. Biological macromolecules and the forces that stabilize them. Lecture 2: (CLO1, CLO3, CLO4) Biomacromolecules structure determination Lecture 3: (CLO1, CLO3, CLO4) Intermolecular interactions: Protein-drug, protein-protein, protein-DNA, protein-RNA. Lecture 4: (CLO1, CLO2, CLO3, CLO4) Thermodynamics of biomolecules: Entropy, enthalpy, free energy and equilibrium Lecture 5: Free energy and equilibrium (CLO1, CLO2, CLO3, CLO4) Lecture 6: The reactions of the oxidase and reductases in biology (CLO1, CLO2) Lecture 7, 8: Macromolecules in solution: Gibbs-Duhem equation. Molal osmotic coefficients (CLO1, CLO2, CLO3) Lecture 9, 10: Activity coefficients. Solute-solute interactions. (CLO1, CLO2) Lecture 11, 12: Macromolecules in solution: Hydrophobic interactions. Protein folding and unfolding. (CLO1, CLO2, CLO4, CLO5) Lecture 13: Electrochemical equilibrium. Membrane potentials. Membrane biophysics. Dynamic structure of lipid bilayer membrane. (CLO1, CLO2)	

	Lecture 14: Ion channels and transporters. Ion pumps. Bioenergetics. (CLO1, CLO2, CLO5)
Examination forms	<i>Written exams (Midterm+Final)</i>
Study and examination requirements	Students are expected to spend at least 8 hours per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that students may be refused to take final assessment if they attend less than 80% of scheduled classes. Regular attendance is essential for successful performance and learning in this course, particular in the view of the interactive teaching and learning approach adopted.
Reading list	Textbooks: David Eisenberg and Donald Crothers, "Physical Chemistry with Applications to the Life Sciences", The Benjamin Cummings Publishing Company, Inc., 1979 References: Kensal E. van Holde, W. Curtis Johnson, and Pui Shing Ho, "Principles of Physical Biochemistry" (Second Edition 2006), Pearson Prentice Hall, Upper Saddle River, New Jersey 07458 (ISBN 0-13-046427-9)

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			M					
2			M					
3	H						M	
4	H					H	M	
5			M			H		

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Organization. Biological macromolecules and the forces that stabilize them.	CLO1, CLO2	5%	- Lecture presentation - Group forming. - Class discussion - Read book & lecture 2.	

2	Lecture 2: Biomacromolecules structure determination	CLO1, CLO3, CLO4	5%	- Lecture presentation - Class discussion - Read book & lecture 3.	
3	Lecture 3: Intermolecular interactions: Protein-drug, protein-protein, protein-DNA, protein-RNA.	CLO1, CLO3, CLO4	10%	- Lecture presentation - Class discussion - Read book & lecture 4.	
4	Lecture 4: Thermodynamics of biomolecules: Entropy, enthalpy, free energy and equilibrium	CLO1, CLO2, CLO3, CLO4	10%	- Class discussion - Read book & lecture 5.	
5	Lecture 5: Free energy and equilibrium.	CLO1, CLO2	5%	- Lecture presentation - Class discussion - Read book & lecture 6.	
6	Lecture 6: The reactions of the oxidase and reductases in biology	CLO1, CLO2	5%	Lecture presentation - Class discussion - Read book & lecture 7.	
7,8	Lecture 7, 8: Macromolecules in solution: Gibbs-Duhem equation. Molal osmotic coefficients	CLO1, CLO2, CLO3	10%	Lecture presentation - Class discussion - Read book & lecture 10.	
9	Midterm				
10, 11	Lecture 9, 10: Activity coefficients. Solute-solute interactions.	CLO1, CLO2	15%	- Lecture presentation - Class discussion - Read book & lecture 12.	
12, 13	Lecture 11, 12: Macromolecules in solution: Hydrophobic interactions. Protein folding and unfolding.	CLO1, CLO2, CLO4, CLO5	15%	- Lecture presentation - Class discussion - Read book & lecture 13.	

14	Lecture 13: Electrochemical equilibrium. Membrane potentials. Membrane biophysics. Dynamic structure of lipid bilayer membrane.	CLO1, CLO2	10%	- Lecture presentation - Class discussion	
15	Lecture 14: Ion channels and transporters. Ion pumps. Bioenergetics..	CLO1, CLO2, CLO5	10%	- Lecture presentation - Class discussion	
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Written exam (70%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Quiz (20%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Class participation (10%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass

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

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Describe the principles, work-flow and applications of different techniques/methods in biochemistry	
	Skill	CLO2. Appropriately select or access the suitability of certain biochemistry methods for specific applications and propose the solution for problems emerged from certain applications. CLO3. Compose a mini-review, present and discuss about a topic related to a method/technique in biochemistry.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to nucleic acid, purification & quantification of nucleic acid	1	I, T, U
	DNA amplification (PCR) and electrophoresis	1	I, T, U
	DNA cloning and hybridization	1	I, T, U
	DNA sequencing and genome mapping	1	I, T, U
	DNA mutagenesis and gene inactivation	1	I, T, U
	Introduction to protein technology & amino acid analysis	1	I, T, U
	Protein quantification and sequencing	1	I, T, U
	Protein gel electrophoresis	1	I, T, U
	Immunoassays	1	I, T, U
	Recombination protein expression	1	I, T, U
	Protein purification	1	I, T, U
	Mass spectrometry and proteomics	1	I, T, U
	Protein structure determination and peptide synthesis	1	I, T, U
	Introduction to carbohydrate technology	1	I, T, U
	Introduction to lipid technology	1	I, T, U

Examination forms	Multiple-choice, true/false, matching, short-answer questions, essay
Study and examination requirements	<i>Requirements for successfully passing the module</i> 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. Garrett RH, Grisham CM. <i>Biochemistry</i>. 5th edition ed. Belmont, CA: Cengage Learning; 2012 2012/01/05/. 1280 p. 2. Nelson DL, Cox MM. <i>Lehninger Principles of Biochemistry</i> 5th (fifth) edition Text Only. 5th edition ed: W.H. Freeman & Company; 2008 2008/01/01/. 3. Sambrook J. <i>Molecular Cloning: A Laboratory Manual, Third Edition</i>. 3rd edition ed. Cold Spring Harbor, N.Y: Cold Spring Harbor Laboratory Press; 2001 2001/01/15/. 2344 p. 4. <i>Current protocols in molecular biology</i>, edited by M. Ausubel, R. Brent, R.E. Kingston, D.D. Moore, J.G. Seidman, J.A. Smith, and K. Struhl. Volumes 1 and 2. John Wiley & Sons, Inc., Media, PA, 1988, <i>Mol Reprod Dev</i>. 1989 1989;1(2):146-. en. 5. <i>Protein Biochemistry and Proteomics - 1st Edition</i> [updated 2022/04/18/07:51:54]. Available from: https://www.elsevier.com/books/protein-biochemistry-and-proteomics/rehm/978-0-12-088545-9.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2		H						
3								H

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to nucleic acid, purification &	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1-4

	quantification of nucleic acid				
2	DNA amplification (PCR) and electrophoresis	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1-4
3	DNA cloning and hybridization	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1-4
4	DNA sequencing and genome mapping	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1-4
5	DNA mutagenesis and gene inactivation	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1-4
6	Introduction to protein technology & amino acid analysis	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1, 2, 4, 5
7	Protein quantification and sequencing	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1, 2, 4, 5
8	Protein gel electrophoresis	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1, 2, 4, 5
9	Midterm				
10	Immunoassays	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1, 2, 4, 5
11	Recombination protein expression	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1, 2, 4, 5
12	Protein purification	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1, 2, 4, 5
13	Mass spectrometry and proteomics	1, 2	In-class quiz	Lecture, Discussion, In-class quiz	1, 2, 4, 5
14	Protein structure determination and peptide synthesis		In-class quiz	Lecture, Discussion, In-class quiz	1, 2, 4, 5
15	Introduction to carbohydrate technology	1, 3	Writing assignment, Presentation	Lecture, Discussion, Presentation	1, 2, 4
16	Introduction to lipid technology	1, 3	Writing assignment, Presentation	Lecture, Discussion, Presentation	1, 2, 4
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class quizzes/Writing Assignment/Presentation (30%)			50%Pass
Midterm exam (30%)	50%Pass	50%Pass	
Final exam (40%)	50%Pass	50%Pass	

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

5. Rubrics (optional)

1. Grading checklist

Grading checklist for Writing Assignment			
Student:	HW/Assignment:		
Date:	Evaluator:		
	Max.	Score	Comments
Content (70%)			
Summary clearly summarizes principal content	10		
Each chapter demonstrates complete knowledge of relevant issues (Hollistic rubrics)	60		
Organization (10%)			
Distinct summary and main chapters	5		
Content clearly and logically organized, good transitions	5		
Presentation (10%)			
Correct spelling, grammar, and syntax	5		
Clear and easy to read	5		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

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.

Holistic rubric for evaluating the content of writing assignment	
Score	Description
5	Chapter demonstrates complete knowledge of relevant issues
4	Chapter demonstrates considerable knowledge of relevant issues
3	Chapter demonstrates partial knowledge of relevant issues
2	Chapter demonstrates little knowledge of relevant issues
1	Chapter demonstrates no knowledge of relevant issues
0	Task not attempted

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis	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/ evaluation. Viewpoints of experts are

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

	discussed in priority order.	are identified clearly.	(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 appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.

Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May 12, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Methods in Biochemistry Laboratory

Course Code: **BTBC314IU**

1. General information

Course designation	This course aims to provide a basic understanding and the accurate execution of different techniques in biochemistry.					
Semester(s) in which the course is taught	2					
Person responsible for the course	MSc. Le Tran Hong Ngoc					
Language	English					
Relation to curriculum	Compulsory, Specialized					
Teaching methods	lab work, lab project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	0	2		
	Contact hours	50	0	50		
	Self-Study hours	60	0	60		
	Total workload	110	0	110		
Credit points	2 credits (4.00 ECTS)					
Required and recommended prerequisites for joining the course	Biochemistry 2					
Course objectives	Students will be able to perform common techniques such as qualitative and quantitative analysis and characterization of macromolecules. In addition, students will have a chance to learn the techniques in protein preparation such as separation, recombinant, and sequences.					
Course learning outcomes	Upon the successful completion of this course students will be able to:					

	Competency level	Course learning outcome (CLO)		
	Knowledge	CLO1. Understanding concepts of genes and all the components and their functions in living organisms CLO2. Know different methods for protein identification and quantification as well as electrophoresis		
	Skill	CLO3. Able to perform different methods for protein identification and quantification as well as electrophoresis CLO4. Able to create competent cells and perform recombination in bacterial cells..		
	Attitude	CLO5. Develop critical thinking skills to be able to solve practical problems, explain things and analyze different situations		
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lab work (4 hours) Teaching Levels: I(Introduce); T (teach); U (Utilize)			
	Topic		Weight	Level
	Basic biochemistry calculations and techniques		1	I, T, U
	Introduction to techniques		1	I, T, U
	Quantitative determination of protein concentration		1	I, T, U
	Protein electrophoresis (SDS-PAGE)		1	I, T, U
	Preparation for Transformation		1	I, T, U
	Transformation Techniques		1	I, T, U
	Plasmid Preparation		1	I, T, U
	PCR & DNA Electrophoresis		1	I, T, U
Examination forms	oral presentation			
Study and examination requirements	It is compulsory for all students to attend all class sessions. Failure to be present in any session without reason will immediately result in being dropped from the course. Students will be assessed on the basis			

	of their class participation and lab techniques. Questions and comments are strongly encouraged.
Reading list	[1] Keith Wilson, John Walker. Principles and Techniques of Biochemistry and Molecular Biology. 7th Ed. Cambridge University Press. 2010 [3] Department of Applied Chemistry - Methods in Biochemistry Lab Manual.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1		M						
2		M						
3				M				
4				M				
5						M		

The PLOs is designed to meet the skills and ability as defined by ABET and referenced to similar programs of prestigious universities in Singapore, United Kingdom, and United States of America. As a result, the PLOs of the BC program include:

- a) an ability to apply knowledge of mathematics, science, and engineering
- b) an ability to design and conduct experiments, as well as to analyze and interpret data
- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d) an ability to function on multi-disciplinary teams
- e) an ability to identify, formulate, and solve biochemistry science problems
- f) an understanding of professional and ethical responsibility
- g) an ability to communicate effectively
- h) the broad education necessary to understand the impact of science solutions in a global, economic, environmental, and societal context
- i) a recognition of the need for, and an ability to engage in life-long learning
- j) a knowledge of contemporary issues
- k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Basic biochemistry calculations and techniques	1, 2, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2]
2	Introduction to techniques	1, 3, 4, 5	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2]
3	Quantitative determination of protein concentration	1, 3, 4, 5	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2]
4	Protein electrophoresis (SDS-PAGE)	1, 3, 4, 5	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2]
5	Midterm Exam		Short answer Questions MCQ Data analysis		

6	Preparation for Transformation	1, 3, 4, 5	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2]
7	Transformation Techniques	1, 3, 4, 5	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2]
8	Plasmid Preparation	1, 3, 4, 5	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2]
9	PCR	1, 3, 4, 5	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2]
10	DNA Electrophoresis	1, 3, 4, 5	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion	[1], [2]

				- Lab practice	
11	Final exam		Short answer Questions MCQ Data analysis		

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
In-class Quizzes (10%)	Qz1-11 60%Pass	Qz1-11 60%Pass	Qz1-5 60%Pass	Qz5-11 60%Pass	
Lab Reports (30%)	Report 1-11 70%Pass	Report 1-11 70%Pass	Report 1-5 70%Pass	Report 5-11 70%Pass	Report 1-11 70%Pass
Midterm Exam (25%)	80%Pass	80%Pass	80%Pass	80%Pass	80%Pass
Final Exam (35%)	70%Pass	70%Pass	70%Pass	70%Pass	70%Pass

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

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		

2. 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 <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are	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	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

	questioned thoroughly.		experts are taken as mostly fact, with little questioning.	
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes one's 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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion);	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences

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

Source: Association of American Colleges and Universities

6. Date revised: May 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Physical Chemistry

Course Code: BT405IU

1. General information

Course designation	<i>On campus course</i>					
Semester(s) in which the course is taught	3					
Person responsible for the course	<i>Assoc. Prof. Nguyen Tan Khoi</i>					
Language	English					
Relation to curriculum	<i>Compulsory</i>					
Teaching methods	<i>lecture, lesson.</i>					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
Contact hours	37.5		37.5	0		
Self-Study hours	90		90	0		
Total workload	127.5		127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	Prerequisites: General chemistry Recommended previous courses: Organic Chemistry 1, Biochemistry 1, Analytical Chemistry.					
Course objectives	Provides students with knowledge on Diffusion, Effusion, collision volume, mean free path. Equilibrium Conditions, Partial Molar					

	Quantities. Solutions, Ideal Solutions & Colligative Properties, Non-Ideal Solutions, Ionic Solutions ; properties of gases. Pressure, ideal gas law; Kinetic Molecular theory and its derivation. Molecular speed measurements Zeroth Law of Thermodynamics and Thermometry, First Law of Thermodynamics. Thermochemistry, Second Law of Thermodynamics & Entropy. Chemical Equilibrium, Electrochemistry, Phase Equilibria, Gravitational, Electric, Magnetic, Surface Work; Kinetics. Analyzing the underlying working mechanism of physical chemical phenomena; Oral presentation; Teamwork and problem-solving.	
Course learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	Course learning outcome (CLO)
	Knowledge	CLO1. Understanding of concepts, key points of physical chemical phenomena CLO2. Able to distinguish different mechanisms of physical chemical phenomena.
	Skill	CLO3. Know how to analytically break a phenomena down into mathematical models. CLO4. Know how to design an experiment to measure a desired quantity.
	Attitude	CLO5. Able to solve practical problems and analyze the solutions.
Content	Lecture 1: properties of gases. (CLO1, CLO2) Lecture 2: (CLO1, CLO3, CLO4) Properties of liquids and solids. Lecture 3: (CLO1, CLO3, CLO4) Zeroth Law of Thermodynamics and Thermometry, First Law of Thermodynamics. Lecture 4: (CLO1, CLO2, CLO3, CLO4) Thermochemistry, Second Law of Thermodynamics & Entropy Lecture 5: (CLO1, CLO2, CLO3, CLO4) Third Law of Thermodynamics Lecture 6: (CLO1, CLO2) Legendre Transforms & the Gibbs Function, Maxwell Relations Lecture 7, 8: Macromolecules in solution: Gibbs-Duhem equation. Molal osmotic coefficients. (CLO1, CLO2, CLO3) Lecture 9, 10: (CLO1, CLO2, CLO4, CLO5) Equilibrium Conditions, Partial Molar Quantities. Lecture 11: (CLO1, CLO2) Solutions, Ideal Solutions & Colligative Properties, Non-Ideal Solutions, Ionic Solutions.	

	Lecture 12, 13: (CLO1, CLO2, CLO5) Chemical Equilibrium, Electrochemistry, Phase Equilibria, Gravitational, Electric, Magnetic, Surface Work. Lecture 14: Kinetics. (CLO5)
Examination forms	<i>Written exams (Midterm+Final)</i>
Study and examination requirements	Students are expected to spend at least 8 hours per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. University regulations indicate that students may be refused to take final assessment if they attend less than 80% of scheduled classes. Regular attendance is essential for successful performance and learning in this course, particular in the view of the interactive teaching and learning approach adopted.
Reading list	Textbooks: Physical Chemistry, 9th Ed.; Peter Atkins and Julio de Paula; Freeman; 2009 References: Physical Chemistry, 3rd Ed.; Gilbert Castellan; Addison-Wesley; 1983. 2. Physical Chemistry, 2nd Ed; J. Philip Bromberg; Allyn & Bacon; 1984. 3. Physical Chemistry, 6th Ed.; Ira N. Levine; McGraw Hill; 2009

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	M							
2			M					
3	M		M					
4	M					H	M	
5						H	M	

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: properties of gases.	CLO1, CLO2	5%	- Lecture presentation - Group forming.	

				- Class discussion - Read book & lecture 2.	
2	Lecture 2: Properties of liquids and solids.	CLO1, CLO3, CLO4	5%	- Lecture presentation - Class discussion - Read book & lecture 3.	
3	Lecture 3: Zeroth Law of Thermodynamics and Thermometry, First Law of Thermodynamics.	CLO1, CLO3, CLO4	10%	- Lecture presentation - Class discussion - Read book & lecture 4.	
4	Lecture 4: Thermochemistry, Second Law of Thermodynamics & Entropy	CLO1, CLO2, CLO3, CLO4	10%	- Class discussion - Read book & lecture 5.	
5	Lecture 5: Third Law of Thermodynamics	CLO1, CLO2	5%	- Lecture presentation - Class discussion - Read book & lecture 6.	
6	Lecture 6: Legendre Transforms & the Gibbs Function, Maxwell Relations	CLO1, CLO2	5%	-Lecture presentation - Class discussion - Read book & lecture 7	
7,8	Lecture 7, 8: Macromolecules in solution: Gibbs-Duhem equation. Molal osmotic coefficients.	CLO1, CLO2, CLO3	10%	Lecture presentation - Class discussion - Read book & lecture 9	
9	Midterm				
10, 11	Lecture 9, 10: Equilibrium Conditions, Partial Molar Quantities.	CLO1, CLO2	15%	- Lecture presentation - Class discussion	

				- Read book & lecture 11.	
12, 13	Lecture 11: Solutions, Ideal Solutions & Colligative Properties, Non-Ideal Solutions, Ionic Solutions.	CLO1, CLO2, CLO4, CLO5	15%	- Lecture presentation - Class discussion - Read book & lecture 12.	
14	Lecture 12, 13: Chemical Equilibrium, Electrochemistry, Phase Equilibria, Gravitational, Electric, Magnetic, Surface Work.	CLO1, CLO2	10%	- Lecture presentation - Class discussion	
15	Lecture 14 : Kinetics.	CLO1, CLO2, CLO5	10%	- Lecture presentation - Class discussion	
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Written exam (70%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Quiz (20%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Class participation (10%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass

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

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Nutritional Biochemistry

Course Code: **BTBC317IU**

1. General information

Course designation	This course aims to provide a basic understanding of the metabolism of macro and micronutrients and of the role of nutrition in influencing cell growth, cancer development, blood formation and gene function. Emphasis will be on clinical relevance, the integration of biochemical pathways and how this is modulated by dietary change, and on techniques used to assess both normal dietary requirements and nutrient deficiencies. Students will be introduced to biochemical mechanisms of energy expenditure and storage, including metabolic adaptation to periods of fasting or food intake					
Semester(s) in which the course is taught	1,2					
Person responsible for the course	Dr. Hoang Le Son					
Language	English					
Relation to curriculum	Specialization					
Teaching methods	lecture, lesson, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
Contact hours	37.5		37.5	0		
Self-Study hours	90		90	0		
Total workload	127.5		127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	Biochemistry 1 and Biochemistry 2					

Course objectives	This course will enhance previous biomedical and nutrition knowledge with particular reference to recent developments in nutritional sciences and biomarkers of human health and diseases.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand basic knowledge of the following: • The role of nutrition in health • Metabolism of nutritional components in human body • Nutritional metabolic disorder • Factors influencing nutrition • Biochemical process in nutrition • Biomarkers in nutrition CLO2. Understanding of the chemistry and nutritional values of food components and the reactions they undergo during processing and storage.	
	Skill	CLO3. Calculate nutritional needs for different people with different backgrounds.	
	Attitude	CLO4. Explain nutritional needs or balance of everyday life using nutritional biochemistry concepts.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Basic concepts of Nutrition The basic of a healthy diet	1	I, T
	Regulation of nutrient utilization Human digestion and absorption	1	T, U
	Metabolism and energy Metabolism of carbohydrates in rumen, adipose tissue, liver, mammary glands	1	T, U
Metabolism of lipids in rumen, adipose tissue, liver, mammary glands	1	T, U	

	Metabolism of proteins, amino acids in rumen, adipose tissue, liver, mammary glands	1	T, U
	Electrolytes and water balance: electrolyte concentrations of body fluids; concept of acidosis and alkalosis.	1	T, U
	Minerals: nutritional significance of dietary calcium, magnesium, iron, zinc, copper, phosphorus, iodine, trace elements (selenium, manganese, cobalt...) Vitamin: dietary sources, biochemical functions and specific deficiency diseases	1	T, U
	Nutritional metabolic disorders	1	T, U
	Imbalance in diet composition of ruminants, bloat, urea-toxicity, ketosis, low fat syndrome... Life style, nutrition, health and diseases.	1	T, U
	Basic food group What is nutritional balance and how to calculate the nutritional balance Composition balanced diet	1	T, U
	Recommended dietary allowance for average person Popular nutritional supplements Functional foods	1	T, U
	Scientific bases for nutrition interventions in human health and disease Biochemical, physiological and clinical aspects of various macronutrients, micronutrients and other components of foods relevant to human health and disease	1	T, U
	Nutritional requirements: nutritional requirements during pregnancy and lactation Nutritional requirements: nutritional requirements for diabetic disease...	1	T, U
	Biomarkers of nutritional status Biomarkers of liver function Biomarkers of cardiovascular disease	1	T, U
	Biomarkers of diabetes mellitus Biomarkers of oxidative stress, antioxidants and inflammation	1	T, U

Examination forms	Multiple-choice questions, short-answer questions
Study and examination requirements	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent, requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.
Reading list	[1] Biochemical and physiological aspects of human nutrition by Martha H Stipanuk , W B Saunders Company, Philadelphia, 2000. [2] Modern nutrition in health and disease edited by Maurice E Shils, Moshe Shike, A. Catharine Ross, Benjamin Caballero, Robert J Cousins, 10th Edition Lippincott Williams & Wilkins, Baltimore, 2006

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-4) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2			M					
3								M
4		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Basic concepts of Nutrition The basic of a healthy diet	1,2		Lecture presentation, Group forming, Class discussion	[1],[2]
2	Regulation of nutrient utilization Human digestion and absorption	1,2,3, 4	Project	Lecture presentation, Class discussion	[1],[2]
3	Metabolism and energy	1,2,3, 4	Project	Lecture presentation,	[1],[2]

	Metabolism of carbohydrates in rumen, adipose tissue, liver, mammary glands			Class discussion	
4	Metabolism of lipids in rumen, adipose tissue, liver, mammary glands	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
5	Metabolism of proteins, amino acids in rumen, adipose tissue, liver, mammary glands	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
6	Electrolytes and water balance: electrolyte concentrations of body fluids; concept of acidosis and alkalosis.	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
7	Minerals: nutritional significance of dietary calcium, magnesium, iron, zinc, copper, phosphorus, iodine, trace elements (selenium, manganese, cobalt...) Vitamin: dietary sources, biochemical functions and specific deficiency diseases	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
8	Nutritional metabolic disorders	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
9	Midterm exam				
10	Imbalance in diet composition of ruminants, bloat, urea-toxicity, ketosis, low fat syndrome... Life style, nutrition, health and diseases.	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
11	Basic food group What is nutritional balance and how to calculate the nutritional balance	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]

	Composition balanced diet				
12	Recommended dietary allowance for average person Popular nutritional supplements Functional foods	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
13	Scientific bases for nutrition interventions in human health and disease Biochemical, physiological and clinical aspects of various macronutrients, micronutrients and other components of foods relevant to human health and disease	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
14	Nutritional requirements: nutritional requirements during pregnancy and lactation Nutritional requirements: nutritional requirements for diabetic disease...	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
15	Biomarkers of nutritional status Biomarkers of liver function Biomarkers of cardiovascular disease	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
16	Biomarkers of diabetes mellitus Biomarkers of oxidative stress, antioxidants and inflammation	1,2,3,4		Lecture presentation, Class discussion	[1],[2]
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4

Project (25%)			x	x
Midterm exam (25%)	x	x	x	x
Final exam (50%)	x	x	x	x

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Grading checklist

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

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are	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.

	questioned thoroughly.		taken as mostly fact, with little questioning.	
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes one's 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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion);	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences

	evidence and perspectives discussed in priority order.	(consequences and implications) are identified clearly.	some related outcomes (consequences and implications) are identified clearly.	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
Organizational	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the

	presentation compelling, and the speaker appears polished and confident.	presentation interesting, and the speaker appears comfortable.	presentation understandable, and the speaker appears tentative.	understandability of the presentation, and the speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Nutritional Biochemistry Laboratory

Course Code: **BTBC318IU**

1. General information

Course designation	This subject will provide an introduction to key methods in biochemistry in order to test nutrients.				
Semester(s) in which the course is taught	1, 2				
Person responsible for the course	<i>MSc. Bui Ngoc Yen Tram</i>				
Language	English				
Relation to curriculum	<i>Elective</i>				
Teaching methods	<i>lecture, coaching, assignment/report</i>				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	0	1	
	Contact hours	25	0	25	
	Self-Study hours	30	0	30	
	Total workload	55	0	55	
Credit points	1 credit (2.00 ECTS)				
Required and recommended prerequisites for joining the course	None				
Course objectives	Students will be provided with skills of using methods and devices to quantify macro nutrients in foods and micro nutrients in urine. Through this unit, students will become acquainted with the challenges of nutrition analysis and impact of foods in human body, in order to become specialist in research institute,				

Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Describe methods and the skill sets needed to use biochemistry devices to analyze nutrients, have ability to apply knowledge of food science in health	
	Skill	CLO2. An ability to design and conduct experiments, as well as to analyze and interpret data in nutrition research, function on multi-disciplinary teams, use the techniques, skills, and modern engineering tools necessary in biochemistry for nutritional practice.	
	Attitude	CLO6. An understanding of professional and ethical responsibility of biochemistry science in nutrition	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: practice (5 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Orientations (Introduce the laboratory safety, regulation, apparatus in biochemistry to be applied in nutrition field)	1	I, T
	Identification of fat and degree of unsaturated fat content in oils	2	T, U
	Variation in plant protein	2	T, U
	Glycemic index measurement	2	T, U
	Determination of urinary iodine concentration	1	T, U
	Determination of iodine content in household salt	1	T, U
	Field trip	1	I, T
Examination forms	Performance, reports, oral		
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] WHO. (2008). Assessment of iodine deficiency disorders and monitoring their elimination: a guide for program managers. – 3rd ed.		

	[2] Murwani, R. (2009). Techniques of analysis in nutritional biochemistry. [3] Tyburczy, C., Mossoba, M. M., & Rader, J. I. (2013). Determination of trans fat in edible oils: current official methods and overview of recent developments. <i>Analytical and bioanalytical chemistry</i>, 405(17), 5759-5772. [4] Bonjoch, N. P., & Tamayo, P. R. (2001). Protein content quantification by Bradford method. In <i>Handbook of plant ecophysiology techniques</i> (pp. 283-295). Springer, Dordrecht. [5] Hätönen, K. A., Similä, M. E., Virtamo, J. R., Eriksson, J. G., Hannila, M. L., Sinkko, H. K., ... & Valsta, L. M. (2006). Methodologic considerations in the measurement of glycemic index: glycemic response to rye bread, oatmeal porridge, and mashed potato. <i>The American journal of clinical nutrition</i>, 84(5), 1055-1061.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-3) and Intended Learning Outcomes Program/Student Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ISLO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			M					
2				H				
3					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Orientations (Introduce the laboratory safety, regulation, apparatus in biochemistry to be applied in nutrition field) Field trip	1, 2, 4, 6	Prelab, report	Lecture, Practice, homework	[2].3.
2	Identification of fat and degree of unsaturated fat content in oils	2,3,5	Prelab, report	Lecture, Practice, homework	[3].
3	Variation in plant protein	2,3,5	Prelab, report	Lecture, Practice, homework	[4].
4	Glycemic index measurement	2,3,5	Prelab, report	Lecture, Practice, homework	[5].

5	Determination of urinary iodine concentration	2,3,5	Prelab, report	Lecture, Practice, homework	[1].5.3.
6	Determination of iodine content in household salt	2,3,5	Prelab, report	Lecture, Practice, homework	[1].5.2.
7	Examination				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
Prelab (30%)	x		
Report (40%)	x	x	x
Final exam (30%)	x	x	x

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

5. Rubrics (optional)

1. 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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

2. 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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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	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.

	the content of the presentation cohesive.			
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the 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	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/

	presenter's 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

6. Date revised: May 27, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Nutrition Therapy

Course Code: **BTBC417IU**

1. General information

Course designation	This course enables the student to understand the introductory knowledge of diet therapy and planning nutritional care in a clinical setting. This course also enables the student to deal with obesity and diabetes problems.					
Semester(s) in which the course is taught	1,2					
Person responsible for the course	Dr. Hoang Le Son					
Language	English					
Relation to curriculum	Specialization					
Teaching methods	lecture, lesson, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	Biochemistry 1 and Biochemistry 2					
Course objectives	The course will focus on the importance and use of nutritional care in a clinical setting, the concept of food plan management which includes the types and modes of feeding. This course also enables the student to deal with obesity and diabetes problems.					

Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand basic knowledge of the following: • Explain the importance and use of nutritional care in a clinical setting. • Define the concept of food plan management which includes the types and modes of feeding. • Explain the terms of energy balance and weight management. • Define healthy weight, obesity, and underweight; their incidence, diagnosis, clinical implications, medical and nutritional management, and other related aspects. • Understand some recent knowledge about AIDS, diabetes and cancer. CLO2. Understand the knowledge of diet therapy and nutritional care in clinical setting	
	Skill	CLO3. Apply nutrition needs for different people in cycle life.	
	Attitude	CLO4. Explain many aspects of everyday life using nutrition therapy concepts.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction: Nutritional Care in Clinical Setting. • Illness and nutrition. • The team approach	1	I, T
Nutritional Therapy: Food Plan Management. • Nutrition care plans. • Standard and modified diets. • Mode of feeding.	3	T, U	
Energy Balance and Weight Management.	4	T, U	

	• Human energy system. • Body composition and body weight. • Weight management problems. • Reasonable treatment of obesity.		
	Energy Balance and Weight Management. • Human energy system. • Body composition and body weight.	1	T, U
	Nutrition and Diabetes Mellitus. • Nature of diabetes. • Metabolic pattern of diabetes. • General management of diabetes. • Medical nutrition therapy principles.	4	T, U
	Nutrition-AIDS and Cancer.	2	T, U
Examination forms	Multiple-choice questions, short-answer questions		
Study examination requirements and	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent, requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.		
Reading list	[1] Williams, S.R. and Schlenker, E.D. 2006. Essentials of Nutrition and Diet Therapy.9 th edition. Mosby.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-4) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILO							
	1	2	3	4	5	6	7	8
1			L					
2			L					
3							M	M
4		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction: Nutritional Care in Clinical Setting. • Illness and nutrition. • The team approach	1,2		Lecture presentation, Group forming, Class discussion	[1]
2,3,4	Nutritional Therapy: Food Plan Management. • Nutrition care plans. • Standard and modified diets. • Mode of feeding.	1,2,3,4	Project	Lecture presentation, Class discussion	[1]
5,6,7,8	Energy Balance and Weight Management. • Human energy system. • Body composition and body weight. • Weight management problems. • Reasonable treatment of obesity.	1,2,3,4	Project	Lecture presentation, Class discussion	[1]
9	Midterm exam				
10	Energy Balance and Weight Management. • Human energy system. • Body composition and body weight.	1,2,3,4	Project	Lecture presentation, Class discussion	[1]
11,12,13,14	Nutrition and Diabetes Mellitus. • Nature of diabetes. • Metabolic pattern of diabetes. • General management of diabetes. • Medical nutrition therapy principles.	1,2,3,4	Project	Lecture presentation, Class discussion	[1]

15,16	Nutrition-AIDS and Cancer.	1,2,3,4	Project	Lecture presentation, Class discussion	[1]
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Project (25%)			x	x
Midterm exam (25%)	x	x	x	x
Final exam (50%)	x	x	x	x

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Grading checklist

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

Criterion 1...:			
Criterion ...:			
Part (....%)			
TOTAL SCORE	100		

2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description

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

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact,

	Viewpoints of experts are questioned thoroughly.	Viewpoints of experts are subject to questioning.	analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes one's 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	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

	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
Organiza tion	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.
Languag e	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable,	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker

	the speaker appears polished and confident.	the speaker appears comfortable.	and the speaker appears tentative.	appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Nutrition Therapy Laboratory

Course Code: **BTBC418IU**

1. General information

Course designation	This course helps students learn about: Medical nutrition care process for typical case studies with hypertension, diabetes mellitus, and cardiovascular diseases, nutrition assessment, diagnosis, intervention, monitoring and evaluation for students' nutritional problems					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	<i>MSc. Bui Ngoc Yen Tram</i>					
Language	English					
Relation to curriculum	<i>Elective</i>					
Teaching methods	<i>lecture, coaching, assignment/report</i>					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	0	1		
	Contact hours	25	0	25		
	Self-Study hours	30	0	30		
	Total workload	55	0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	Nutritional Biochemistry					
Course objectives	Students will be provided with skills of using methods and devices assess nutritional problems by 4 categories: anthropometry, biochemical tests, clinical signs and historical dietary intake, diagnose nutritional problems following PES format, plan new menu for patients and show method for monitoring and evaluation, assess and diagnose nutritional problems for					

	themselves, plan new menu and evaluate result after 1 month. Through this unit, students will become acquainted with the challenges of medical nutrition therapy in order to become specialists in hospitals.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Know mechanism of hypertension, diabetes mellitus, and malnutrition, apply medical nutrition therapy for supporting diseases treatment, know about how to do diagnosis by nutritional assessment with PES statement, distinguish between medical diagnosis and nutritional diagnosis, plan new menu based on diagnosis and evaluate result.	
	Skill	CLO2. An ability to use the techniques, skills to assess and diagnose nutritional problem and establish new menu for diseases	
	Attitude	CLO3. An understanding of professional and ethical responsibility of nutrition in clinic side, communicate and work with group member effectively, develop life-long learning attitude	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: practice (5 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Orientations (Introduce the safety, regulation, apparatus, nutrition care process, nutrition assessment, medical nutrition and ethic in nutrition at clinical side)	1	I, T
	Mechanism of noncommunicable diseases, Portion size estimation and dietary recall	1	T, U
	Medical nutrition therapy for weight control	2	T, U
	Medical nutrition therapy for diabetes	2	T, U
	Medical nutrition therapy for hypertension	2	T, U
	Self nutritional problem intervention project	2	T, U
Examination forms	Performance, reports, oral		
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] Mahan, L. K., & Raymond, J. L. (2016). Krause's food & the nutrition care process-ebook. Elsevier Health Sciences.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-3) and Intended Learning Outcomes/Program/Student Learning Outcomes (ILOs) (1 -8) and level of contribution of CLO to ISLO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			M					
2				H				
3					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Orientations (Introduce the safety, regulation, apparatus, nutrition care process, nutrition assessment, medical nutrition and ethic in nutrition at clinical side)	1	Prelab, report	Lecture, Practice, homework	[1].1
2	Mechanism of noncommunicable diseases, Portion size estimation and dietary recall	2,3	Prelab, report	Lecture, Practice, homework	[1].2
3	Medical nutrition therapy for weight control	2,3	Prelab, report	Lecture, instruction, assessment, presentation , planning, cooking	[1].4.21
4	Medical nutrition therapy for diabetes	2,3	Prelab, report	Lecture, instruction, assessment, presentation , planning, cooking	[1].5.30
5	Medical nutrition therapy for hypertension	2,3	Prelab, report	Lecture, instruction, assessment, presentation , planning, cooking	[1].5.33

6	Self nutritional problem intervention project	1	Prelab, report	Lecture, instruction, assessment, presentation, planning	[1].3
7	Examination				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Prelab (30%)	x		
Report (40%)	x	x	x
Final exam (30%)	x	x	x

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

5. Rubrics (optional)

1. 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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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

	necessary for full understanding.	impeded by omissions.	ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	
Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged.	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective,	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

	Others' points of view are synthesized within position (perspective, thesis/hypothesis).	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	Language choices are thoughtful and generally support the effectiveness of the presentation.	Language choices are mundane and commonplace and partially support the effectiveness of the	Language choices are unclear and minimally support the effectiveness of the presentation. Language in

	the presentation. Language in presentation is appropriate to the audience.	Language in presentation is appropriate to the audience.	presentation. Language in presentation is appropriate to the audience.	presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May 27, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology

A handwritten signature in blue ink, appearing to read 'N. Van Thuan', with a horizontal line underneath.

Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Clinical Nutrition

Course Code: **BTBC419IU**

1. General information

Course designation	This course presents the principles and practice of scientifically based clinical nutrition. Topics discussed include nutritional assessment (nutritional implications of the physical exam, laboratory studies, and more), macronutrients, micronutrients, phytonutrients, enzymes, and other factors. Various conditions are discussed with emphasis on understanding that they are different expressions of imbalances and/or dysfunction that are preventable and correctable in many cases. Besides, students learn how to set up a plan on nutrition care based on the clinical biochemistry tests and patient diagnostics and monitoring and evaluating the process of nutrition care.					
Semester(s) in which the course is taught	1,2					
Person responsible for the course	Dr. Hoang Le Son					
Language	English					
Relation to curriculum	Specialization					
Teaching methods	lecture, lesson, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended	Biochemistry 1 and Biochemistry 2					

prerequisites for joining the course			
Course objectives	The Clinical Nutrition will focus on the science and practice of consuming and utilizing foods. One essential function to keep living organisms alive. Also, the course will introduce the understanding of the chemistry of food components (proteins, carbohydrates, fats, water...) and the reactions they undergo during processing and storage.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand basic knowledge of the following: • Diagnostics and assessment of nutritional biochemistry tests • Understanding the process by which the body fights against toxicity • How to approach nutritional and lifestyle to enhance a person’s ability to handle conditions such as cardiovascular conditions, cancer, chronic fatigue syndrome, diabetes, rheumatoid arthritis, gastrointestinal disorders, and others. • Understanding the implications of different diets such as vegetarian, vegan, high protein, carbohydrate restriction, macrobiotics, etc. • How to plan clinical nutrition for patients • Evaluation and monitoring clinical nutrition process CLO2. Understanding of diet factors influencing the human body.	
	Skill	CLO3. Apply their critical thinking and problem-solving skills.	
	Attitude	CLO4. Assess many effects of everyday life using clinical nutrition concepts.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to clinical nutrition	1	I, T

	Tissue examination	1	T, U
	Nutritional biochemistry tests	1	T, U
	Diagnostic criteria and biochemical indexes for planning clinical nutrition	2	T, U
	Nutrition interaction: nutrition-nutrition, nutrition-diseases and nutrition-drugs.	2	T, U
	Nutritional therapy in gastrointestinal diseases	1	T, U
	Nutritional therapy in diabetes	1	T, U
	Nutritional therapy in cardiovascular disease	1	T, U
	Nutritional therapy in urinary tract	1	T, U
	Nutritional therapy in respiratory diseases	1	T, U
	Nutritional therapy in intensive care	1	T, U
	Nutritional therapy in cancer & Review	2	T, U
Examination forms	Multiple-choice questions, short-answer questions		
Study examination requirements and	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent, requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.		
Reading list	[1] Mahan LK and Escott-Stump S. Krause's Food, Nutrition and Diet Therapy, 11th ed. 2003 ed. [2] Zeman F and Ney D. <i>Applications in Medical Nutrition Therapy</i>, 2nd ed. 1996 Green version. [3] <i>International Dietetics and Nutrition Terminology (IDNT) Reference Manual: Standardized Language for the Nutrition Care Process. 2nd OR 3rd Edition.</i> [4] Nutrition Care Manual & Pediatric Nutrition Care Manual (online diet manual).		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-4) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILO							
	1	2	3	4	5	6	7	8
1			L					
2			L					
3								M
4		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to clinical nutrition	1,2		Lecture presentation, Group forming, Class discussion	[1],[2],[3],[4]
2	Tissue examination	1,2,3,4	/Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
3	Nutritional biochemistry tests	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
4,5	Diagnostic criteria and biochemical indexes for planning clinical nutrition	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
6,7	Nutrition interaction: nutrition-nutrition, nutrition-diseases and nutrition-drugs.	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
8	Nutritional therapy in gastrointestinal diseases	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
9	Midterm exam				

10	Nutritional therapy in diabetes	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
11	Nutritional therapy in cardiovascular disease	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
12	Nutritional therapy in urinary tract	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
13	Nutritional therapy in respiratory diseases	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
14	Nutritional therapy in intensive care	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
15,16	Nutritional therapy in cancer & Review	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Project (25%)			x	x
Midterm exam (25%)	x	x	x	x
Final exam (50%)	x	x	x	x

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Grading checklist

Grading checklist for Written Reports

Student:		HW/Assignment:	
Date:		Evaluator:	
	Max.	Score	Comments
Part 1..... (....%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion ...:			
Part 2..... (....%)			
Criterion 1 ...:			
Criterion ...:			
Part 3..... (....%)			
Criterion 1 ...:			
Criterion ...:			
Part (....%)			
TOTAL SCORE	100		

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable

	consistently observable and is skillful and makes the content of the presentation cohesive.	consistently observable within the presentation.	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the 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 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 establishes the presenter's	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.	credibility/ authority on the topic.	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

6. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Clinical Nutrition Laboratory

Course Code: BTBC420IU

1. General information

Course designation	This course helps students learn about: Nutrition assessment in format from clinical side, anthropometric assessment including weight measurement, height measurement for normal and bedridden patients, waist, hip and mid upper arm circumference measurement, calculate accuracy and precision of the measurement, clinical signs of malnutrition and vitamin deficiency, biochemical results and historical dietary intake assessment					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	MSc. Bui Ngoc Yen Tram					
Language	English					
Relation to curriculum	Elective					
Teaching methods	lecture, coaching, assignment/report					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		Credit	0	1		
Contact hours	25		0	25		
Self-Study hours	30		0	30		
Total workload	55		0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	Nutritional Biochemistry					

Course objectives	Students will be provided with skills of using methods and devices to assess nutritional status by anthropometric assessment, observe biochemical results, clinical signs to determine nutritional problems, recall and record historical dietary intake in order to assess nutritional problems, diagnose nutrition problems in PES format, write down SOAP note and practice in real nutrition assessment form of some international hospitals. Through this unit, students will become acquainted with the challenges of clinical nutrition in order to become specialists in hospitals.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Know definition and necessary of anthropometric assessment in nutrition, meaning and mechanism of biochemical results in human body	
	Skill	CLO2. An ability to use the techniques, skills, and modern engineering tools necessary to estimate portion size of each food group, test blood glucose level and blood pressure, diagnose nutrition problem following PES format, writing SOAP note and do real assessment in form of international hospitals	
	Attitude	CLO3. An understanding of professional and ethical responsibility of nutrition in clinic side, communicate and work with group member effectively, good attitude with instructor	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: practice (5 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Orientations (Introduce the safety, regulation, apparatus, nutrition care process, nutrition assessment and ethic in nutrition at clinical side)	1	I
	Anthropometric assessment	2	T, U
	Biochemical assessment	1	U
	Clinical assessment	2	T, U
	Portion size estimation and dietary recall	2	T, U
	Nutrition assessment and soap note	2	T, U
	Examination forms	Performance, reports, oral	

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] Simko, M. D., Cowell, C., & Gilbride, J. A. (1995). Nutrition assessment: A comprehensive guide for planning intervention. Jones & Bartlett Learning.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-3) and Intended Learning Outcomes/Program/Student Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			M					
2				H				
3					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Orientations (Introduce the safety, regulation, apparatus, nutrition care process, nutrition assessment and ethic in nutrition at clinical side)	1	Prelab, report 1	Lecture, Practice, homework	[1].1
2	Anthropometric assessment	2,3	Prelab, report 2	Lecture, Practice, homework	[1].3
3	Biochemical assessment	2,3	Prelab, report 3	Lecture, Practice, homework	[1].4
4	Clinical assessment	2,3	Prelab, report 4	Lecture, Practice, homework	[1].5
5	Portion size estimation and dietary recall	2,3	Prelab, report 5	Lecture, Practice, homework	[1].6
6	Nutrition assessment and soap note	1	Prelab, report 6	Lecture, Practice, homework	[1].1, 7
7	Examination				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
Prelab (30%)	x		
Report (40%)	x	x	x
Final exam (30%)	x	x	x

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

5. Rubrics (optional)

1. 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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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

	necessary for full understanding.	impeded by omissions.	ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	
Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged.	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective,	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

	Others' points of view are synthesized within position (perspective, thesis/hypothesis).	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	Language choices are thoughtful and generally support the effectiveness of the presentation.	Language choices are mundane and commonplace and partially support the effectiveness of the	Language choices are unclear and minimally support the effectiveness of the presentation. Language in

	the presentation. Language in presentation is appropriate to the audience.	Language in presentation is appropriate to the audience.	presentation. Language in presentation is appropriate to the audience.	presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May 27, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology

A handwritten signature in blue ink, appearing to read 'N. Van Thuan', is written over a horizontal line.

Assoc.Prof., Dr. Nguyễn Văn Thuận



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: DRUG DEVELOPMENT

Course Code: **BTBC408IU**

1. General information

Course designation	<i>This course will emphasize on the original and developmental process of herbal and synthetic drugs. Application of organic synthesis and modern methods towards the development of pharmaceutical drugs will be covered, followed by discussions of some relevant drug targets. The course will provide the groundwork for learning medicinal chemistry and pharmaceutical technology.</i>				
Semester(s) in which the course is taught	1, 2				
Person responsible for the course	Dr. Le Quang Phong				
Language	English				
Relation to curriculum	Compulsory				
Teaching methods	Lecture, lesson, homework, quiz.				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	3		
Contact hours	37.5		37.5	0	
Self-Study hours	90		90	0	
Total workload	127.5		127.5	0	
Credit points	<i>3 credits (4.62 ECTS)</i>				

Required and recommended prerequisites for joining the course	Organic Chemistry 2	
Course objectives	Students will be provided with knowledge of different stages of drug development, sources of pharmaceutical medicines and optimization of drug structures. Students will be provided with the ability to analyze and design synthetic strategies of medicinal compounds.	
Course learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	Course learning outcome (CLO)
	Knowledge	CLO1. Understand different stages of the drug development process. CLO2. Understand sources of pharmaceutical medicines.
	Skill	CLO3. Know how to distinguish the use of different reagents for the same/different drug transformation. CLO4. Able to analyze, optimize and design reasonable synthetic strategies of targeted medicinal compounds.
	Altitude	CLO5. Able to work in a team and present ideas of chosen topics

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> 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 drug development</td><td>3</td><td>T, I</td></tr><tr><td>Herbal medicine development</td><td>1</td><td>T, I</td></tr><tr><td>Functional groups transformation. Part 1: Common reactions in drug synthesis</td><td>1</td><td>T, U</td></tr><tr><td>Functional groups transformation. Part 2: Common heterocycles in drugs and their synthesis</td><td>1</td><td>T, U</td></tr><tr><td>Drug target interaction optimization</td><td>1</td><td>T, I</td></tr><tr><td>Drug design: drug access to the target optimization</td><td>1</td><td>T, I</td></tr><tr><td>Retrosynthetic analysis</td><td>2</td><td>T, U</td></tr><tr><td>Combinatorial chemistry</td><td>2</td><td>T, I</td></tr><tr><td>Presentation: Development of a drug</td><td>3</td><td>T, U</td></tr></table>			Topic	Weight	Level	Introduction to drug development	3	T, I	Herbal medicine development	1	T, I	Functional groups transformation. Part 1: Common reactions in drug synthesis	1	T, U	Functional groups transformation. Part 2: Common heterocycles in drugs and their synthesis	1	T, U	Drug target interaction optimization	1	T, I	Drug design: drug access to the target optimization	1	T, I	Retrosynthetic analysis	2	T, U	Combinatorial chemistry	2	T, I	Presentation: Development of a drug	3	T, U
Topic	Weight	Level																															
Introduction to drug development	3	T, I																															
Herbal medicine development	1	T, I																															
Functional groups transformation. Part 1: Common reactions in drug synthesis	1	T, U																															
Functional groups transformation. Part 2: Common heterocycles in drugs and their synthesis	1	T, U																															
Drug target interaction optimization	1	T, I																															
Drug design: drug access to the target optimization	1	T, I																															
Retrosynthetic analysis	2	T, U																															
Combinatorial chemistry	2	T, I																															
Presentation: Development of a drug	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 based on their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.																																
Reading list	[1] <i>The Organic Chemistry of Drug Design and Drug Action</i>, 2nd Edition, R. B. Silverman (Elsevier) [2] <i>An Introduction to Medicinal Chemistry</i>, 4th Edition, G. L. Patrick (Oxford) [3] <i>Strategies for Organic Drug Synthesis and Design</i>, 2nd Edition, Daniel Lednicer (Wiley-Interscience) [4] <i>An Introduction to Drug synthesis</i>, G. L. Patrick (Oxford)																																

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-5) and Intended Learning Outcomes (ILOs) (1 -8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLOs	ILO							
	1	2	3	4	5	6	7	8
1			L					
2			L					
3			M					
4			H					
5							M	M

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1-3	Lecture 1: Introduction to drug development	1	Quiz1, HW1	Lecture, In Class-Quiz, HW	
4	Lecture 2: Herbal medicine development	2	Quiz2, HW2	Lecture, In Class-Quiz, HW	
5	Lecture 3: Functional groups transformation. Part 1: Common reactions in drug synthesis	3	Quiz3, HW3	Lecture, In Class-Quiz, HW	
6	Lecture 3: Functional groups transformation. Part 2: Common heterocycles in drugs and their synthesis	3	Quiz4, HW4	Lecture, In Class-Quiz, HW	
7	Lecture 4: Drug target interaction optimization	3,4	Quiz5, HW5	Lecture, In Class-Quiz, HW	
8	Lecture 5: Drug design: drug access to the target optimization	3,4	Quiz6, HW6	Lecture, In Class-Quiz, HW	
	Midterm				
9-10	Lecture 6: Retrosynthetic analysis	3,5	Quiz7, HW5	Lecture, In Class-Quiz, HW	
11-12	Lecture 7: Combinatorial chemistry	3,5	Quiz8, HW6	Lecture, In Class-Quiz, HW	
13-15	Presentation: Development of a drug	1,2,3,4,5	Quiz9	Lecture, In Class-Quiz, HW	
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Homework (10%)	90% Pass	90% Pass	90% Pass	90% Pass	90% Pass
In-class exercises/quizzes (10%)	80% Pass	80% Pass	80% Pass	80% Pass	80% Pass
Presentation (10%)	90% Pass	90% Pass	90% Pass	90% Pass	90% Pass
Midterm exam (30%)	70% Pass	70% Pass	70% Pass	70% Pass	
Final exam (40%)			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. Grading checklist

5.2. Holistic rubric

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

5.3. Analytic rubric

6. Date revised: May 24th, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Drug Development Laboratory

Course Code: BTBC423IU

1. General information

Course designation	The drug development laboratory course will emphasize on the application of organic synthesis towards the development of pharmaceutical targets. The important organic reactions in drug synthesis are covered, together with several drug syntheses. The course will provide the groundwork for learning medicinal chemistry and pharmaceutical technology. In addition, the student will be trained in the proper way to write a scientific laboratory report.						
Semester(s) in which the course is taught	6,7,8						
Person responsible for the course	TS. Lê Quang Phong						
Language	English						
Relation to curriculum	Core major						
Teaching methods	lecture, lab works.						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	0	1			
Contact hours		25	0	25			
Self-Study hours		30	0	30			
Total workload		55	0	55			
Credit points	1credit (2.00 ECTS)						
Required and recommended prerequisites for joining the course	Organic chemistry 2						
Course objectives	The course will introduce and emphasized students on the techniques of reaction set up, purification, extraction, and characterization of medicinal compounds.						

Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Utilize basic knowledge gained from General Chemistry course to perform common calculations, including mass balance, limiting reagent, and percent yield. CLO2. Draw the mechanism and understand the fuctions of reagents in drug synthesis reactions. Characterize prepared substances by physical/spectroscopic means.	
	Skill	CLO3. Develop laboratory skills in handling chemical, assembling glassware and performing the following techniques as a part of synthetic procedures: distillation, reflux, separation, isolation, and crystallization. CLO4. Ability to analyze, predict, and explain many aspects of everyday life using laboratory skills and organic chemistry concepts.	
	Attitude	CLO5. Engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately, using general guidelines and basic knowledge about the common hazards associated with them in an organic chemistry laboratory.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (4 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Lab 1: Synthesis of aspirin	1	T, U
	Lab 2: Synthesis of paracetamol	1	T,U
	Lab 3: Synthesis of levodopa	1	T,U
	Lab 4: Synthesis of salicylanilide	1	T,U
Lab 5: Synthesis of bromsalicylanilide	1	T,U	
Examination forms	Multiple-choice questions, short-answer questions		

Study and examination requirements	Student is expected that you will spend at least 8 hours per week studying this course. This time should be made up of reading, working on exercises and problem, group assignment and attending class lectures and tutorials. University regulations indicate that if students attend less than 80% of scheduled classes, they may be refused final assessment. Regular attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted. The Organic Chemistry Lab requires full attendance in order to pass the course.
Reading list	[1] Contemporary Drug Synthesis, Jie-Jack Li, Douglas S. Johnson, Drago R. Sliskovic, Bruce R. Roth (Wiley-Interscience) [2] The Organic Chemistry of Drug Design and Drug Action, 2nd Edition, R. B. Silverman (Elsevier) [3] The Art of Writing Reasonable Organic Reaction Mechanisms, 2nd Edition, Robert B. Grossman (Springer-Verlag) [4] Department of Applied Chemistry – Drug Development Lab Manual.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-5) and Intended Learning Outcomes (ILOs) (1 -8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CLOs	1	2	3	4	5	6	7	8
1	L			L				
2			H					
3				H		H		
4		H		M				
5					M			

3. Planned learning activities and teaching methods.

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lab 1: Synthesis of aspirin	1,2,3, 4, 5	Group repore Prelab quizzes	Lecture presentation Group forming	[1],[2],[3],[4]
2	Lab 2: Synthesis of paracetamol	1,2,3, 4, 5	Group report Prelab quizzes	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
3	Lab 3: Synthesis of levodopa	1,2,3, 4, 5	Group report Prelab quizzes	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
4	Lab 4: Synthesis of salicylanilide	1,2,3, 4, 5	Group report Prelab	- Introduce practical procedure	[1],[2],[3],[4]

			quizzes	- Solve problems - Group working	
5	Lab 5: Synthesis of bromsalicylanilide	1,2,3, 4, 5	Group report Prelab quizzes	- Introduce practical procedure - Solve problems - Group working	[1],[2],[3],[4]
12	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Assignment (70%): Performance (10%), Report (40%), Quizzes (20%)	Test 70%Pass	Test, Report 70%Pass	Performance 90%Pass	Test 50%Pass	Test 50%Pass
Final (30%)	80%Pass	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. 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	5		
Introduction demonstrates thorough knowledge of relevant background and prior work	5		
Summary of methods and experiment procedures	5		
Results contain enough information of experiments	20		
Analysis and discussion demonstrate good subject mastery	20		
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, citation and syntax	10		
Clear lab notes 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	Issue/ problem to be considered critically is stated without clarification or description.

			unknown.	
Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	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	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 presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the	Language choices are thoughtful and generally support the effectiveness	Language choices are mundane and commonplace and partially	Language choices are unclear and minimally support the effectiveness of the

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

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**

School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Cosmetics and Cosmeceuticals 1

Course Code: **BTBC409IU**

1. General information

Course designation	Cosmetics are designed for use on the hair and body, especially the face, to improve its appearance. Cosmeceuticals represent a marriage between cosmetics and pharmaceuticals. This course is designed to impart knowledge and skills necessary for the fundamental need for cosmetic and cosmeceutical products.					
Semester(s) in which the course is taught	1,2					
Person responsible for the course	Dr. Hoang Le Son					
Language	English					
Relation to curriculum	Specialization					
Teaching methods	lecture, lesson, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	Organic chemistry 2					
Course objectives	The course will introduce and emphasize on the concepts of cosmetics, anatomy of skin v/s hair, general excipients used in cosmetics and the key ingredients used in cosmetics and cosmeceuticals, also the building blocks for various formulations. The various key ingredients and basic					

	science to develop cosmetics and cosmeceuticals will be focused in this course.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand basic knowledge of the following: • Understand the concepts of cosmetics, anatomy of skin v/s hair, general excipients used in cosmetics. • The key building blocks for various formulations. • The current technologies in the market CLO2. Understand the relationship between cosmetics and cosmeceuticals.	
	Skill	CLO3. Apply their critical thinking and problem-solving skills for applying biochemistry in Cosmetics and cosmeceuticals.	
	Attitude	CLO4. Evaluate quantity, quantitative, stability, side effects, toxicity using cosmetics and cosmeceuticals concepts.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Cosmetics & Cosmeceuticals- Biological Aspects	1	T, U
	Introduction to Dermatology	2	T, U
	Cosmetic Chemistry; toxicology of cosmetics; microbiological aspects of cosmetics & cosmeceuticals	1	T, U
	Cosmetic & Cosmeceutical Technology	2	T, U
Formulation Building Blocks	1	T, U	

	Classification of Cosmetic & Cosmeceutical Products	1	T, U
	Design of Cosmetic & Cosmeceutical Products	1	T, U
	Perfume and Colors	1	T, U
	Herbal Cosmetics & Cosmeceuticals	2	T, U
	Fundamentals of Cosmetic & Cosmeceutical Evaluation	1	T, U
	Cosmetic & Cosmeceutical Management	1	T, U
	Cosmetic Jurisprudence	1	T, U
Examination forms	Multiple-choice questions, short-answer questions		
Study and examination requirements	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent, requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.		
Reading list	[1] Cosmetics - Formulation, manufacture and quality control PP.Sharma, 4th edition [2] Handbook of cosmetic science and Technology A.O.Barrel, M.Paye and H.I.Maibach. 3rd edition [3] Harry's Cosmeticology. 8th edition [4] Cosmeceuticals and Active Cosmetics: Drugs versus Cosmetics, Peter Elsner and Howard I. Maibach (Eds.), CRC Press (2005). [5] Plants in Cosmetics: Plants and Plant Preparations used as Ingredients for Cosmetic Products. Anton R., Patri F. Silano V., Council of Europe Publishing (2001).		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-4) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2			L					

3								M
4		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Cosmetics & Cosmeceuticals- Biological Aspects	1,2		Lecture presentation, Group forming, Class discussion	[1],[2],[3],[4],[5]
2,3	Introduction to Dermatology	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
4	Cosmetic Chemistry; toxicology of cosmetics; microbiological aspects of cosmetics & cosmeceuticals	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
5,6	Cosmetic & Cosmeceutical Technology	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
7	Formulation Building Blocks	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
8	Classification of Cosmetic & Cosmeceutical Products	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
9	Midterm exam				
10	Design of Cosmetic & Cosmeceutical Products	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]

11	Perfume and Colors	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
12,13	Herbal Cosmetics & Cosmeceuticals	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
14	Fundamentals of Cosmetic & Cosmeceutical Evaluation	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
15	Cosmetic & Cosmeceutical Management	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
16	Cosmetic Jurisprudence	1,2,3,4		Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Project (25%)			x	x
Midterm exam (25%)	x	x	x	x
Final exam (50%)	x	x	x	x

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Grading checklist

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

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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

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 choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.
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 appropriate reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May 18th, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
 School of Biotechnology
 Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Cosmetics and Cosmeceuticals 2

Course Code: **BTBC410IU**

1. General information

Course designation	Cosmetics are designed for use on the hair and body, especially the face, to improve its appearance. Cosmeceuticals represent a marriage between cosmetics and pharmaceuticals. This course is designed to impart knowledge and skills necessary for the fundamental need for cosmetic and cosmeceutical products.					
Semester(s) in which the course is taught	1,2					
Person responsible for the course	Dr. Hoang Le Son					
Language	English					
Relation to curriculum	Specialization					
Teaching methods	lecture, lesson, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	Cosmetics and Cosmeceuticals 1					
Course objectives	The course will introduce and emphasize on the concepts of cosmetics, anatomy of skin v/s hair, general excipients used in cosmetics and the key ingredients used in cosmetics and cosmeceuticals, also the building blocks for various formulations. The various key ingredients and basic					

	science to develop cosmetics and cosmeceuticals will be focused in this course.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. demonstrate basic knowledge of the following: • Understand the concepts of cosmetics, preservative, natural compounds, and cosmetics regulations in different countries. • The key ingredients used in cosmetics and cosmeceuticals. • The key building blocks for various formulations. • The current technologies in the market CLO2. Understanding the relationship between cosmetics and cosmeceuticals.	
	Skill	CLO3. Development of their critical thinking and problem-solving skills for applying biochemistry in Cosmetics and cosmeceuticals.	
	Attitude	CLO4. Ability to explain many aspects of everyday life using cosmetics and cosmeceuticals concepts.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Skin care products	4	T, U
	Moisturizing Lotion	1	T, U
	Hair care products and shampoo	2	T, U
	Lipstick	1	T, U
	Face powder	1	T, U
	Nail care products	1	T, U
Antiperspirants and deodorants	2	T, U	

	Eye products	1	T, U	
	Dental care products	1	T, U	
	Packaging and label in cosmeceuticals	1	T, U	
Examination forms	Multiple-choice questions, short-answer questions			
Study and examination requirements	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent, requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.			
Reading list	[1] Cosmetics - Formulation, manufacture and quality control PP.Sharma, 4th edition [2] Handbook of cosmetic science and Technology A.O.Barrel, M.Paye and H.I.Maibach.3rd edition [3] Harry's Cosmeticology. 8th edition [4] Cosmeceuticals and Active Cosmetics: Drugs versus Cosmetics, Peter Elsner and Howard I. Maibach (Eds.), CRC Press (2005). [5] Plants in Cosmetics: Plants and Plant Preparations used as Ingredients for Cosmetic Products. Anton R., Patri F. Silano V., Council of Europe Publishing (2001).			

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-4) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

CLO	ILO							
	1	2	3	4	5	6	7	8
1			L					
2			L					
3								M
4		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources

1,2,3,4	Skin care products	1,2,3,4	Project	Lecture presentation, Group forming, Class discussion	[1],[2],[3],[4],[5]
5	Moisturizing Lotion	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
6,7	Hair care products and shampoo	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
8	Lipstick	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
9	Midterm exam				
10	Face powder	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
11	Nail care products	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
12,13	Antiperspirants and deodorants	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
14	Eye products	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
15	Dental care products	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
16	Packaging and label in cosmeceuticals	1,2,3,4		Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Project (25%)			x	x
Midterm exam (25%)	x	x	x	x
Final exam (50%)	x	x	x	x

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Grading checklist

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

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.

Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**

**School of Biotechnology
Department of Applied Chemistry**

COURSE SYLLABUS

Course Name: Cosmetics and Cosmeceuticals Laboratory

Course Code: BTBC411IU

1. General information

Course designation	This Fermentation Technology course is designed for the applied chemistry major interested in learning about biological processes and fermented products. The course will equip students with the principles of fermentation technology (e.g. the processes of fermentation, fermentation types and fermentation design), microbial growth kinetics and selection of potential microbes used in industry and principles of major methods for industrial fermentation product recovery and purification. A part of the course will also introduce a number of products (biofuels, food and pharmaceutical substances) produced by using fermentation technology.				
Semester(s) in which the course is taught	2				
Person responsible for the course	MSc. Le Tran Hong Ngoc				
Language	English				
Relation to curriculum	Elective, Specialized				
Teaching methods	lab works, project				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	0	2	
	Contact hours	50	0	50	
	Self-Study hours	60	0	60	
	Total workload	110	0	110	
Credit points	2 credits (4.00 ECTS)				
Required and recommended prerequisites for joining the course	Cosmetics and Cosmeceuticals 1 & 2				

Course objectives	In this course, there will be a clear study about formulation, manufacturing, analysis and marketing of functional products. Emphasis will be on the study of raw materials, testing methods and laboratory procedures that are most commonly used at the moment along with the toxicological aspects and functional and physicochemical evaluations following current regulations.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understanding of concepts, key points and primary challenges of Cosmetics and Cosmeceuticals CLO2. Able to distinguish cosmetic & cosmeceutical products and the regulations for each type of products as well as the available equipment for production.	
	Skill	CLO3. Know the function of each ingredient, how to combine them to create new cosmetic formulations and compare them to available products on the market. CLO4. Know how to apply different tests for Quality assurance and Quality control during R&D and scale-up process	
	Attitude	CLO5. Develop critical thinking skills to be able to solve practical problems and analyze different situations while maintaining ethical integrity.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lab work (4 hours) Teaching Levels: I(Introduce); T (teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to Course Soap Making	1	I, T, U
	Detergents	1	I, T, U

	Shampoo & Conditioner	1	I, T, U
	Lotion	1	I, T, U
	Cream vs. Ointment	1	I, T, U
	Eye Products	1	I, T, U
	Lip Products	1	I, T, U
	Facial Masks	1	I, T, U
	Serum	1	I, T, U
	Perfume	1	I, T, U
	Product Formulation	1	I, T, U
Examination forms	Short answer questions, Data analysis Questions		
Study and examination requirements	It is compulsory for all students to attend all class sessions. Failure to be present in any session without reason will immediately result in being dropped from the course. Students will be assessed on the basis of their class participation and lab techniques. Questions and comments are strongly encouraged.		
Reading list	[1] P. Elsner and Howard I. Maiback. Cosmeceuticals and Active Cosmetics - Drugs vs. Cosmetics. 2nd Edition (Cosmetic Science and Technology, Volume 27) [2] M. Varinia Michalun and Joseph C. Dicardo. Skin Care and Cosmetic Ingredients. Dictionary. 4th Edition. 2015. [3] Department of Applied Chemistry - Cosmetics and Cosmeceuticals Lab Manual.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1		M						
2		M						
3				M				
4				M				
5								L

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Course Soap Making	1, 2, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2], [3]
2	Detergents	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[2], [3]
3	Shampoo & Conditioner	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[2], [3]
4	Lotion	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2], [3]
5	Cream vs. Ointment	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2], [3]
6	Eye Products	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo	[1], [2], [3]

				- Group forming. - Group discussion - Lab practice	
7	Lip Products	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2], [3]
8	Face Masks	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2], [3]
9	Serum	1, 3, 4	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[1], [2], [3]
10	Perfume	1, 2	Quiz /Lab skills Lab Report	- Lecture - Lab demo - Group forming. - Group discussion - Lab practice	[3]
11	Product Formulation	1, 2, 4, 5	Quiz /Lab skills Lab Report	- Group forming. - Group discussion - Lab practice	[3]
12	Final exam		Project Assessment	Presentation	

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
In-class Quizzes (10%)	Qz1-11 80%Pass	Qz1-11 80%Pass	Qz1-11 80%Pass		
Lab Reports (60%)	Report 1-11 80%Pass	Report 1-11 80%Pass	Report 1-11 80%Pass	Report 1-11 80%Pass	Report 11 80%Pass
Project Presentation (30%)	90%Pass	90%Pass	90%Pass	90%Pass	90%Pass

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

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		

2. 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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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 is)	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

6. Date revised: May 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**

School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Nutraceuticals

Course Code: **BTBC421IU**

1. General information

Course designation	This course is intended to introduce the scientific basis for the development of functional foods and nutraceuticals, including their health benefits, development, and regulation.				
Semester(s) in which the course is taught	1,2				
Person responsible for the course	Dr. Hoang Le Son				
Language	English				
Relation to curriculum	Specialization				
Teaching methods	lecture, lesson, project				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	3		
	Contact hours	37.5	37.5	0	
	Self-Study hours	90	90	0	
	Total workload	127.5	127.5	0	
Credit points	3 credits (4.62 ECTS)				
Required and recommended prerequisites for joining the course	Organic chemistry 2				
Course objectives	Upon successful completion of this course, the students should be able to demonstrate basic knowledge of the following: - Define functional foods and nutraceuticals; recognize the importance link between nutrition and diseases; - Identify major types of health foods and nutraceutical products in the market				

	- Understand the molecular basis of using micronutrients and phytochemicals in prevention of chronic diseases		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand basic knowledge of the following: • Define functional foods and nutraceuticals; recognize the importance link between nutrition and diseases; • Identify major types of health foods and nutraceutical products in the market • Understand the molecular basis of using micronutrients and phytochemicals in prevention of chronic diseases CLO2. • Describe the research on the health benefits of functional foods and nutraceuticals, identifying strengths, limitations, and future directions • Describe the regulations with respect to functional foods and nutraceuticals.	
	Skill	CLO3. Apply in development in functional foods and supplements.	
	Attitude	CLO4. Evaluate the safety and efficacy of using healthy food and nutraceutical products.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Nutraceuticals, functional foods, dietary supplements	1	I, T
	Absorption, disposition, metabolism, and elimination of nutraceuticals	1	T, U
	Phytochemical-based nutraceuticals	1	T, U
Isoflavones: sources, metabolism, and functions	1	T, U	

	Protein, peptide, and marine-based nutraceuticals	2	T, U
	Lipid-based nutraceuticals and nutraceuticals of other sources	2	T, U
	Conjugated polyunsaturated acids: natural sources.		
	Antioxidant and oxidative stress	1	T, U
	Probiotics and prebiotics	1	T, U
	Preparation of nutraceuticals	4	T, U
	International and Vietnam regulations on nutraceuticals and functional foods	1	T, U
Examination forms	Multiple-choice questions, short-answer questions		
Study and examination requirements	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent, requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.		
Reading list	[1] Coates PM, et al. Encyclopedia of dietary supplements. 2-nd ed. New York, London: Informa Healthcare, 2010. [2] Kramer K., Hoppe P., Packer L. Nutraceuticals in health and disease prevention, Marcel Dekker Inc., 2001. [3] Lockwood B.: Nutraceuticals, Ed. a 2-a, Pharmaceutical Press, 2007. [4] Wildman R.E.C.: Handbook of Nutraceuticals and Functional Foods, Ed. a 2-a, CRC Press, 2007. [5] Ildman, Robert. (2007) Nutraceuticals and Functional Foods, second edition. Taylor and Francis Group.		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-4) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2			M					
3		H					M	
4		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Nutraceuticals, functional foods, dietary supplements	1,2		Lecture presentation, Group forming, Class discussion	[1],[2],[3],[4],[5]
2	Absorption, disposition, metabolism, and elimination of nutraceuticals	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
3	Phytochemical-based nutraceuticals	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
4	Isoflavones: sources, metabolism, and functions	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
5,6	Protein, peptide, and marine-based nutraceuticals	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
7,8	Lipid-based nutraceuticals and nutraceuticals of other sources Conjugated polyunsaturated acids: natural sources.	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
9	Midterm exam				
10	Antioxidant and oxidative stress	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]

11	Probiotics and prebiotics	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
12,13,14,15	Preparation of nutraceuticals	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
16	International and Vietnam regulations on nutraceuticals and functional foods	1,2,3,4		Lecture presentation, Class discussion	[1],[2],[3],[4],[5]
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Project (25%)			x	x
Midterm exam (25%)	x	x	x	x
Final exam (50%)	x	x	x	x

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Grading checklist

Grading checklist for Written Reports			
Student:	HW/Assignment:		
.....			
Date:	Evaluator:		
.....			
	Max.	Score	Comments
Part 1..... (....%)			
Criterion 1:			
Criterion 2:			

Criterion 3:			
Criterion ...:			
Part 2..... (....%)			
Criterion 1 ...:			
Criterion ...:			
Part 3..... (....%)			
Criterion 1 ...:			
Criterion ...:			
Part (....%)			
TOTAL SCORE	100		

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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

			and/ or backgrounds unknown.	
Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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/hypothes is)	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,	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).	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
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 choices are imaginative, memorable, and compelling, and enhance the	Language choices are thoughtful and generally support the effectiveness of the	Language choices are mundane and commonplace and partially support the effectiveness of the	Language choices are unclear and minimally support the effectiveness of the presentation.	

	effectiveness of the presentation. Language in presentation is appropriate to the audience.	presentation. Language in presentation is appropriate to the audience.	of the presentation. Language in presentation is appropriate to the audience.	Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the 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

6. Date revised: May 18th, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
 School of Biotechnology
 Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Nutraceuticals Laboratory

Course Code: **BTBC422IU**

1. General information

Course designation	This course aims to - Provide students with knowledge on the Phytochemical testing, identification of antioxidant activities - Provide instructions on some of the basic techniques and applications for different methods in UV spectrometry - Understand the analysis of data to reach sound scientific conclusions				
Semester(s) in which the course is taught	2				
Person responsible for the course	MSc. Lê Trần Hồng Ngọc				
Language	English				
Relation to curriculum	Elective				
Teaching methods	Lab work				
Workload (incl. contact hours, self-study hours)			Lecture	Lab	
		<i>Credit</i>	0	1	
	Contact hours	25	0	25	
	Self-Study hours	30	0	30	
	Total workload	55	0	55	
Credit points	1 credit (2.00 ECTS)				
Required and recommended prerequisites for joining the course	None				

Course objectives	Apply scientific methods and lab equipment to the quantification of total phenolic and flavonoid contents, and the determination of antioxidant capacity in fruits. Through this unit, students will become acquainted with the current techniques used nutraceuticals production in order to become specialists in research institutes or factories.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Gain fundamental knowledge the role of phenolic, flavonoid and antioxidant	
	Skill	CLO2. Capable of using various techniques, skills, and modern engineering tools necessary in biochemistry to design and conduct experiments in order to quantify total phenolic, flavonoid contents and antioxidant potential in fruits	
	Attitude	CLO3. Develop an understanding of professional and ethical responsibility of biochemistry science in nutraceuticals.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: practice (5 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction Chemical preparation	1	I, T
	Total phenolic content quantification	1	T, U
	Total flavonoid content quantification	1	T, U
	α -diphenyl- β -picrylhydrazyl free radical scavenging	1	T, U
	Identification of TPC & TFC in Green Juice Effervescent Tablets	1	T, U
	Final Exam		
Examination forms	short-answer questions, data analysis, experimental design		
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] Wang, L., & Weller, C. L. (2006). Recent advances in extraction of nutraceuticals from plants. <i>Trends in Food Science & Technology</i>, 17(6), 300-312. [2] Sánchez-Rangel, J. C., Benavides, J., Heredia, J. B., Cisneros-Zevallos, L., & Jacobo-Velázquez, D. A. (2013). The Folin–Ciocalteu assay revisited: improvement of its specificity for total phenolic content determination. <i>Analytical Methods</i>, 5(21), 5990-5999. [3] He, X., Liu, D., & Liu, R. H. (2008). Sodium borohydride/chloranil-based assay for quantifying total flavonoids. <i>Journal of Agricultural and Food Chemistry</i>, 56(20), 9337-9344. [4] Kedare, S. B., & Singh, R. P. (2011). Genesis and development of DPPH method of antioxidant assay. <i>Journal of food science and technology</i>, 48(4), 412-422. [5] Kumar, V., & Joshi, V. K. (2016). Kombucha: Technology, microbiology, production, composition and therapeutic value. <i>International journal of food and fermentation technology</i>, 6(1), 13-24.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1 -11) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILOs							
CLO	1	2	3	4	5	6	7	8
1		M						
2				M				
3						M		

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Orientations (Introduce the laboratory safety, regulation, apparatus in biochemistry to be applied in nutraceuticals)	1	Prelab, report	Lecture, instruction, field trip	[1]..
2	Total phenolic content quantification	2,3	Prelab, report	Lecture, instruction, perform experiment	[2].
3	Total flavonoid content quantification	2,3	Prelab, report	Lecture, instruction, perform experiment	[3].

4	α -diphenyl- β -picrylhydrazyl free radical scavenging	2,3	Prelab, report	Lecture, instruction, perform experiment	[4].
5	Probiotic drinks	2,3	Prelab, report	Lecture, instruction, perform experiment	[5].
6	Field trip	1	Prelab, report	Lecture, instruction, perform experiment	[1].
7	Examination				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Prelab (30%)		Lab 1,2,3,4,5 50%Pass	
Report (35%)		Lab 1,2,3,4,5 50%Pass	
Final exam (35%)	Part 1 50%Pass	Part 1,2,3,4,5,6 50%Pass	Part 1,6 50%Pass

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

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		

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.

Source: Association of American Colleges and Universities

6. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận

	vaccines, immunotherapy, and immune disorders are taught. Critical thinking, scientific writing and soft skills are included in class activity.		
Course learning outcomes	Upon the successful completion of this course students will have or have the following improved		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understanding what Immunology is and the skill sets needed to be an immunologist. CLO2. Understanding the immune system components and how they function together. CLO3. Understanding on the basic applications of Immunology	
	Skill	CLO4. Critical Thinking, Teamworking, Scientific writing.	
	Attitude	CLO5. Seriousness, Care, Hardworking, Activeness, Patience.	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Introduction to the course, Immunology and Immune System: History, General Concepts and Application	1	I, U
	Structure of the Immune System: Cells of the immune system: Tissues and organs of the immune system	2	I, T
	Weapons of the immune system and related applications: Antibodies, Complements, Blood transfusion and hemostasis	2	T, U
	Means of the Immune System: TCR and MHC	2	T, U
	Mode of the Immune Responses-1: Development of Adaptive Immune Response- Antigen processing and presentation, Result of Antigen presentation- Cell-mediated and humoral immune responses	2	T, U
	Mode of the Immune Response-2: Innate Immunity, Inflammation, AMPs	1	T
	Immune Regulation	1	T, U
	Immune Responses to Microbes and Tumors	2	T, U
	Abnormal Immune Responses: Autoimmunity, Hypersensitivity, Congenital and Acquired Immunodeficiency	2	T, U
	SUM	15	
Examination forms	Multiple-choice 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] Immunology / David Male; 8th Edition; Mosby/ Elsevier, 2013 [2] Kuby Immunology/ Jenni Punt; 8th Edition; Maximillian Learning/ New York, 2018

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-5) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	L							
2	L							
3			M					
4								M
5					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to the course, Immunology and Immune System: History, General Concepts and Application	1, 4,5	Quiz1	Lecture, Discussion, In Class-Quiz	[1]; [2]
2-3	Structure of the Immune System: Cells of the immune system: Tissues and organs of the immune system	2,4,5	Quiz 2; 3	Lecture, In Class-Quiz, HW*	[1]
4-5	Weapons of the immune system and related applications: Antibodies, Complements, Blood transfusion and hemostasis	2,4,5	Quiz4	Lecture, Discussion	[2]
6-7	Means of the Immune System: TCR and MHC	2,4,5	Quiz5	Lecture, Discussion	[1] [2]

Week	Topic	CLO	Assessments	Learning activities	Resources
8-9	Mode of the Immune Responses-1: Development of Adaptive Immune Response- Antigen processing and presentation, Result of Antigen presentation- Cell-mediated and humoral immune responses	2,3.4, 5	Quiz6	Lecture, Discussion	[1]
9	Midterm				
10	Mode of the Immune Response-2: Innate Immunity, Inflammation, AMPs	2,3.4, 5	Presentation	Lecture, Group work,	[1]
11	Immune Regulation	2,3.4, 5	Presentation	Lecture, Group work	[2]
12-13	Immune Responses to Microbes and Tumors	2,3.4, 5	Presentation	Lecture, Group Work	[1] [2]
14-15	Abnormal Immune Responses: Autoimmunity, Hypersensitivity, Congenital and Acquired Immunodeficiency	2,3.4, 5	Quiz7	Lecture, In Class-Quiz	[1] [2]
16	Final exam				

* Homework is assigned to groups of students. It includes scientific writing and presentation tasks which are due after Mid-term examination.

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
In-class exercises/quizzes (5%)	Qz1	Qz2-6	Qz7	Qz1-7	
Attendance/progress (5%)					Each lecture 80%Pass
Scientific Writing/ Presentation (20%)	x	x	x	x	x
Midterm exam (30%)	x	x	x		x
Final exam (40%)		x	x	x	x

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

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Practice in Immunology

Course Code: BT336IU

1. General information

Course designation	<i>The course will introduce students to various methods used in the immunological field. It will equip students with skills on immunological techniques and complement the information gained in lecture. This includes determining types of immune cells, blood types, detecting specificity of antigen and antibody, ELISA.</i>					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	Dr. Tran Thi Hai Yen					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lectures, discussion, demonstrations, labworks.					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	0	1		
	Contact hours	25	0	25		
	Self-Study hours	30	0	30		
	Total workload	55	0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	Biology (BT311IU) Practice in Biology (BT312IU) Immunology (BT335IU)					
Course objectives	The course will provide the students:					

	• <i>Knowledge</i>: Mechanisms and applications of immunological techniques, not only in human health’s diagnosis, but also in other species. • <i>Skill</i>: Practice on immunological tests to analyze human health problems and other species. • <i>Competences</i>: Ability to design and conduct experiments, as well as to analyze and interpret data.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand mechanisms and applications of immunological techniques	
	Skill	CLO2. Identify the cells of immune systems and determine the relative number of them. CLO3. Demonstrate the specific interaction between Antibody and antigen by different methods. CLO4. Determine blood type. CLO5. Practice on ELISA.	
	Competence	CLO6. Set up experiment, analyze and interpret data	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (4 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	<i>Cells of the Immune System</i> • <i>Identify the leukocytes (white cells)</i> • <i>Determine the relative numbers of the types of leukocytes</i>	1	I, T, U
	<i>Hemagglutination</i> • Demonstrate the specific interaction between antibody and antigen • Determine ABO blood groups • Coombs test	1	I, T, U
	<i>Immunoprecipitation:</i> • Radial immunodiffusion • Immuno-double diffusion	1	I, T, U
	<i>Immunoelectrophoresis</i> • Countercurrent electrophoresis • Rocket electrophoresis	1	I, T, U
	<i>Enzyme-linked immunosorbent assay (ELISA)</i> <i>Detection of hepatitis B surface antigen (HBsAg)</i>	1	I, T, U
	Lab review and Examination of immunological lab work	1	I, T, U
	Examination forms	Lab reports; Multiple-choice questions, short-answer questions	

Study and examination requirements	Attendance: A minimum attendance of 80% is compulsory for the class sessions. Students will be assessed based on their participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must get more than 50/100 points overall to pass this module.
Reading list	Animal Tissue Techniques. WH Freeman and Co. Gretchen L.H. Cellular and Molecular Immunology, 8th Edition. 2015. Abul K. Abbas, Andrew H. Lichtman. Saunders/ Elsevier. Bio-Rad Laboratories: Antibody to Hepatitis B surface antigen. 2014. Redmond, USA. HiPer® Immunodiffusion and Immunoelectrophoresis Teaching kits. 2012. HiMedia Laboratories, India Humason's Animal Tissue Techniques. The Johns Hopkins University Press. Jance K.P. and Martin P.S. Lab-manual for Immunology Practical Class. School of Biotechnology, International University [Internal Use]

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-6) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L		L			
2				H				
3				H				
4				H				
5				H				
6						M		

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Cells of the Immune System Identify the leukocytes (white cells) Determine the relative numbers of the types of leukocytes	1, 2, 6	Progress, Report	Lecture, Discussion, Practice	2, 6
2	Hemagglutination - Demonstrate the specific interaction between antibody and antigen - Determine ABO blood groups	1, 3, 4, 6	Progress, Report	Lecture, Discussion, Practice	2, 6

	• Coombs test				
3	Immunoprecipitation: • Radial immunodiffusion • Immuno-double diffusion	1, 3, 6	Progress, Report	Lecture, Discussion, Practice	2, 4, 6
4	Immunoelectrophoresis • Countercurrent electrophoresis • Rocket electrophoresis	1, 3, 6	Progress, Report	Lecture, Discussion, Practice	2, 4, 6
5	Enzyme-linked immunosorbent assay (ELISA) Detection of Hepatitis B surface antigen (HBsAg)	1, 4, 6	Progress, Report	Lecture, Discussion, Practice	5, 6
6	Final exam	1-6			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Progress (40%)	x 100% pass	x 100% pass	x 100% pass	x 100% pass	x 100% pass	x 100% pass
Lab report (30%)	x 70% pass	x 70% pass	x 70% pass	x 70% pass	x 70% pass	x 70% pass
Exam (30%)	x 50% pass	x 50% pass	x 50% pass	x 50% pass	x 50% pass	x 50% pass

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

5. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Fermentation Technology

Course Code: **BTBC415IU**

1. General information

Course designation	This Fermentation Technology course is designed for the applied chemistry major interested in learning about biological processes and fermented products. The course will equip students with the principles of fermentation technology (e.g. the processes of fermentation, fermentation types and fermentation design), microbial growth kinetics and selection of potential microbes used in industry and principles of major methods for industrial fermentation product recovery and purification. A part of the course will also introduce a number of products (biofuels, food and pharmaceutical substances) produced by using fermentation technology.					
Semester(s) in which the course is taught	1,2					
Person responsible for the course	Dr. Hoang Le Son					
Language	English					
Relation to curriculum	Specialization					
Teaching methods	lecture, lesson, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					

Required and recommended prerequisites for joining the course	Enzymology	
Course objectives	Students will learn the fermentation processes as well as the affected factors, methods and characteristics of microorganisms. Major methods and applications of fermentation technology in various fields including environmental technology, food technology and pharmaceutical science are introduced and emphasized in this course.	
Course learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	Course learning outcome (CLO)
	Knowledge	CLO1. Understand basic knowledge of the following: - Processes of fermentation - Characteristics of industrial microorganisms - Methods for microbial growth and their metabolite measurements - Advantages and disadvantages of different fermentation modes (solid state vs submerged fermentation, batch vs fed batch fermentation) - Factors affecting fermentation processes and strategy for product enhancement - Fermenter operation - Principles of the major methods used for product recovery and purification in industrial fermentation CLO2. Apply of fermentation technology in various fields including environmental technology, food technology and pharmaceutical science
	Skill	CLO3. Apply critical thinking and problem-solving skills.
	Attitude	CLO4. Predict and assess many aspects of everyday life using fermentation technology concepts.
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)	

	Topic	Weight	Level
	An introduction of fermentation processes	1	I, T
	Industrial microorganisms and selection of microorganisms used in industry	2	T, U
	Microbial growth kinetics	1	T, U
	Fermentation types	2	T, U
	Fermentation Design	1	T, U
	Group discussion	1	T, U
	Statistical methods for fermentation optimization	1	T, U
	Recovery and purification of industrial fermentation products	2	T, U
	Fermented food	1	T, U
	Fermentation for biofuels	2	T, U
	Fermentation for pharmaceutical products	1	T, U
Examination forms	Multiple-choice questions, short-answer questions		
Study and examination requirements	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent, requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.		
Reading list	[1] Fermentation and Biochemical Engineering Handbook (3rd Edition) by Celeste M. Todaro and Henry C. Vogel; 2016. [2] Principles of fermentation technology (3rd Edition) by <i>Peter Stanbury, Allan Whitaker and Steve Hall; 2014.</i>		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-4) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2			L					
3								M
4		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	An introduction of fermentation processes	1		Lecture presentation, Group forming, Class discussion	[1],[2]
2,3	Industrial microorganisms and selection of microorganisms used in industry	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
4	Microbial growth kinetics	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
5,6	Fermentation types	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
7	Fermentation Design	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
8	Group discussion	1,2,3,4		Lecture presentation, Class discussion	
9	Midterm exam				
10	Statistical methods for fermentation optimization	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
11,12	Recovery and purification of industrial fermentation products	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
13	Fermented food	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]
14,15	Fermentation for biofuels	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2]

16	Fermentation for pharmaceutical products	1,2,3,4		Lecture presentation, Class discussion	[1],[2]
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Project (25%)			x	x
Midterm exam (25%)	x	x	x	x
Final exam (50%)	x	x	x	x

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Grading checklist

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

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 synthesis.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

	experts are questioned thoroughly.	experts are subject to questioning.	Viewpoints of experts are taken as mostly fact, with little questioning.	
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes one's 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	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion);	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences

	evidence and perspectives discussed in priority order.	(consequences and implications) are identified clearly.	some related outcomes (consequences and implications) are identified clearly.	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability

	compelling, and the speaker appears polished and confident.	interesting, and the speaker appears comfortable.	understandable, and the speaker appears tentative.	of the presentation, and the speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: May 18, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Fermentation Technology Laboratory

Course Code: BTBC416IU

1. General information

Course designation	This Fermentation Technology course is designed for the applied chemistry major interested in learning about biological processes and fermented products. The course will equip students with the principles of fermentation technology and major methods for industrial fermentation product recovery and purification.					
Semester(s) in which the course is taught	2					
Person responsible for the course	MSc. Le Tran Hong Ngoc					
Language	English					
Relation to curriculum	Elective, Specialized					
Teaching methods	lab works, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	0	1		
	Contact hours	25	0	25		
	Self-Study hours	30	0	30		
	Total workload	55	0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	Microbiology					
Course objectives	Equip students with the understanding of fermentation technology (e.g. the processes of fermentation, fermentation types and fermentation design), microbial growth kinetics and selection of potential microbes					

	used in industry and principles of major methods for industrial fermentation product recovery and purification. Introduce a number of products (biofuels, food and pharmaceutical substances) produced by using fermentation technology.			
Course learning outcomes	Upon the successful completion of this course students will be able to:			
	Competency level	Course learning outcome (CLO)		
	Knowledge	CLO1. Know various types of culture media and their purposes CLO2. Understand how stress/environmental effects trigger different responses in fungi and bacteria, and how to take advantage of those conditions while using a fermenter		
	Skill	CLO3. Practice aseptic technique, using stress/environmental effects trigger different responses in fungi and bacteria, and how to take advantage of those conditions with a fermenter and measure cellulase activity		
	Attitude	CLO4. Develop critical thinking skills and a deep understanding of fermentation techniques to be able to interpret collected data and apply into various fields while complying with safety and ethical standards.		
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lab work (4 hours) Teaching Levels: I(Introduce); T (teach); U (Utilize)			
	Topic		Weight	Level
	Medium Preparation		1	I, T, U
	Aseptic Technique and Culture Preparation		1	I, T, U
	Cellulase Production Using Solid and Submerged Fermentation		1	I, T, U
	Working with a Fermenter		1	I, T, U
	Measure of Cellulase Activity		1	I, T, U
Examination forms	Project Report			

Study examination requirements and	It is compulsory for all students to attend all class sessions. Failure to be present in any session without reason will immediately result in being dropped from the course. Students will be assessed on the basis of their class participation and lab techniques. Questions and comments are strongly encouraged.
Reading list	[1] Peter F Stanbury, Allan Whitaker, Stephen J. Hall. Principles of Fermentation Technology. 3rd Edition. 2017 [2] Department of Applied Chemistry - Fermentation Technology Lab Manual.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1		M						
2		M						
3				M				
4						M		

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Medium Preparation	1, 2, 3, 4	Quiz /Lab skills	- Lecture - Lab demo - Group discussion - Lab practice	[1], [2]
2	Aseptic Technique and Culture Preparation	1, 2, 3, 4	Quiz /Lab skills	- Lecture - Lab demo - Group discussion - Lab practice	[1], [2]
3	Cellulase Production Using Solid and Submerged Fermentation	1, 2, 3, 4	Quiz /Lab skills	- Lecture - Lab demo	[1], [2]

				- Group discussion - Lab practice	
4	Working with a Fermenter	1, 2, 3, 4	Quiz /Lab skills	- Lecture - Lab demo - Group discussion - Lab practice	[1], [2]
5	Measure of Cellulase Activity	1, 2, 3, 4	Quiz /Lab skills	- Lecture - Lab demo - Group discussion - Lab practice	[1], [2]
6	Final exam		Project Report		

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class Quizzes (10%)	Qz1-5 70%Pass	Qz1-5 70%Pass	Qz1-5 70%Pass	Qz1-5 70%Pass
Lab Techniques (20%)	60%Pass	60%Pass	60%Pass	60%Pass
Project Report (70%)	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)

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		

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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

	information necessary for full understanding.	impeded by omissions.	ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	
Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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)	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.

	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

6. Date revised: May 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Clinical Biochemistry

Course Code: **BTBC413IU**

1. General information

Course designation	This course aims to provide a basic understanding of the techniques in diagnostics of various diseases. You will be able to analyze the complex structure of biomolecules in the human body such as glucose, bilirubin, creatinine, ALT, AST and etc.					
Semester(s) in which the course is taught	1,2					
Person responsible for the course	Dr. Hoang Le Son					
Language	English					
Relation to curriculum	Specialization					
Teaching methods	lecture, lesson, project					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		<i>Credit</i>	3			
	Contact hours	37.5	37.5	0		
	Self-Study hours	90	90	0		
	Total workload	127.5	127.5	0		
Credit points	3 credits (4.62 ECTS)					
Required and recommended prerequisites for joining the course	None					
Course objectives	Clinical biochemistry provides basic information about its importance in laboratory diagnostics of various diseases and monitoring the clinical status of patients during the treatment. At the conclusion of the course, students should achieve the following:					

	An understanding of: • The role of clinical biochemistry in health care • Functions of organs in human body • Biochemical disorders and biochemical indexes • Techniques in assay biochemical indexes • Evaluation of biochemical indexes		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Understand the principle of Clinical Biochemistry: • The role of clinical biochemistry in health care • Functions of organs in human body • Biochemical disorders and biochemical indexes • Techniques in assay biochemical indexes • Evaluation of biochemical indexes CLO2. Apply basic information about its importance in laboratory diagnostics of various diseases and monitoring the clinical status of patients during the treatment.	
	Skill	CLO3. Calculate parameters and estimate pathology in Clinical Biochemistry.	
	Attitude	CLO4. Estimate the risks related to disorders in everyday life using clinical biochemistry concepts.	
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 clinical biochemistry • Collection of biological samples- • Anticoagulants preservatives for urine • Physical examination of urine • Tests of urinary normal and abnormal constituents	2	I, T, U
	• Blood glucose • Fasting and postprandial levels • Glucose tolerance test	2	T, U

	- Abnormalities in diabetes mellitus - Galactosemia and fructose urea		
	- Gastric function and fractional test meal - Differentiation of digestive - Absorptive dysfunction in steatorrhea	1	T, U
	- Tests in pancreatic disease - Composition of pancreatic juice - Functions of pancreas	1	T, U
	- Functions of liver - Metabolism of bilirubin - Gallstones - Jaundice - Classification	2	T, U
	- Causes - Differential diagnosis - Tests in liver - Biliary tract diseases - Determination of serum enzyme in liver-disorders	2	T, U
	- Kidney functions - Tests clearance - Creatinine - Urea and phenol red tests - Tests for urea uric acid-creatinine and protein levels in plasma	2	T, U
	Inborn errors of metabolism-reference of fanconi's syndrome-phenylketonuria – von-gierke's disease – cystinuria – galactosemia – albinism	1	T, U
	- Calcium and phosphorous laboratory - Diagnostic test for hypo and hyperparathyroidism - tetany – rickets – renal failure - Bone disease – iron deficiency – tests for anemia	2	T, U
Examination forms	Multiple-choice questions, short-answer questions		
Study and examination requirements	Students must attend at least 80% of the classes in order to qualify for sitting the midterm and final exams. All absence, if not emergent,		

	requires approval of the instructor(s) in advance. Absence for exams requires in-advanced approval of the Office of Academic Affairs.
Reading list	[1] Medical laboratory Technology, Ramnik Sood: Jaypee Brothers Medical Publishers, 2009 [2] Textbook of Biochemistry with Clinical Correlations. Devlin, TM, (Ed.) 5 th ed. WELEY-Liss, 2001. [3] Tietz Fundamentals of Clinical Chemistry, 6 th Edition, Elsevier, 2008 [4] Harper's Illustrated Biochemistry by Nelson and Cox, 4 th Edition McGraw Hill, 2009.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLOs) (1-4) and Intended Learning Outcomes (ILOs) (1-8) level of contribution of CLO to ILO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			L					
2			M					
3		H						
4		H						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1,2	- Introduction to clinical biochemistry - Collection of biological samples- - Anticoagulants preservatives for urine - Physical examination of urine - Tests of urinary normal and abnormal constituents	1,2,3,4	Project	Lecture presentation, Group forming, Class discussion	[1],[2],[3],[4]
3,4	- Blood glucose - Fasting and postprandial levels - Glucose tolerance test - Abnormalities in diabetes mellitus	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]

	Galactosemia and fructose urea				
5	- Gastric function and fractional test meal - Differentiation of digestive - Absorptive dysfunction in steatorrhea	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
6	- Tests in pancreatic disease - Composition of pancreatic juice - Functions of pancreas	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
7,8	- Functions of liver - Metabolism of bilirubin - Gallstones - Jaundice - Classification	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
9	Midterm exam				
10,11	- Causes - Differential diagnosis - Tests in liver - Biliary tract diseases - Determination of serum enzyme in liver-disorders	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
12,13	- Kidney functions - Tests clearance - Creatinine - Urea and phenol red tests - Tests for urea uric acid-creatinine and protein levels in plasma	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
14	Inborn errors of metabolism-reference of fanconi's syndrome-phenylketonuria – von-gierke's disease – cystinuria – galactosemia – albinism	1,2,3,4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]

15,1 6	- Calcium and phosphorous laboratory - Diagnostic test for hypo and hyperparathyroidism - tetany – rickets – renal failure - Bone disease – iron deficiency – tests for anemia	1,2,3, 4	Project	Lecture presentation, Class discussion	[1],[2],[3],[4]
17	Final exam				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Project (25%)			x	x
Midterm exam (25%)	x	x	x	x
Final exam (50%)	x	x	x	x

Note: %Pass: Target that 60% of students having scores greater than 60 out of 100.

5. Rubrics (optional)

1. Grading checklist

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

Criterion ...:			
Part 3..... (....%)			
Criterion 1...:			
Criterion ...:			
Part (....%)			
TOTAL SCORE	100		

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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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,	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).	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant

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

Source: Association of American Colleges and Universities

6. Date revised: May 18th, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



COURSE SYLLABUS

Course Name: Clinical Biochemistry Laboratory

Course Code: **BTBC414IU**

1. General information

Course designation	This course covers various experimental aspects related with clinical biochemistry such as urinary analysis of bioorganic constituents and estimation of proteins, urea, uric acid, minerals, etc., in urine which is essential for early diagnosis of a disease and also assessment of its therapy efficacy.					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	MSc. Bui Ngoc Yen Tram					
Language	English					
Relation to curriculum	Elective					
Teaching methods	lecture, coaching, assignment/report					
Workload (incl. contact hours, self-study hours)			Lecture	Lab		
		Credit	0	1		
	Contact hours	25	0	25		
	Self-Study hours	30	0	30		
	Total workload	55	0	55		
Credit points	1 credit (2.00 ECTS)					
Required and recommended prerequisites for joining the course	None					
Course objectives	Students will be provided with skills and standard methods to monitor disease and treatment by biochemical methods. Laboratory investigations pertaining to clinical biochemistry provide useful information to help students know the diagnosis of illness and the					

	monitoring of treatment. Through this unit, students will become acquainted with the challenges of biochemistry quantification in order to become specialists or technicians in hospitals.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Know about mechanism of diseases, pathway of tested elements in human body, methods to diagnosis, use of devices, analyze results	
	Skill	CLO2. An ability to use the techniques, skills and devices to measure concentration of elements in the human body via urine, take urine, prepare samples, recognize types of errors in tests and give conclusions for the diagnosis.	
	Attitude	CLO3. An understanding of professional and ethical responsibility when use human samples in clinic side, communicate and work with group member effectively, develop life-long learning attitude	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: practice (5 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Orientations (Introduce the safety, regulation, apparatus in clinical biochemistry field)		I, T
	Quantitative Determination of Uric Acid in Human Urines	2	T, U
	Quantitative Determination of Protein and Sugar in Human Urines	2	T, U
	Quantitative Determination of Urea in Human Urines	2	T, U
	Quantitative Determination of Creatinine in Human Urines	2	T, U
	Quantitative Determination of Minerals in Human Urines	1	T, U
Field trip	1	T, U	
Examination forms	Performance, reports, oral		

Study 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] Kumar, V., & Gill, K. D. (2018). Basic concepts in clinical biochemistry: a practical guide. Springer Singapore.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes/Program/Student Learning Outcomes (ILO) (1-8) and level of contribution of CLO to ISLO (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			M					
2				H				
3					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Orientations (Introduce the safety, regulation, apparatus in clinical biochemistry field)	1	Prelab, report	Lecture, Practice, homework	[1].1-7
2	Quantitative Determination of Uric Acid in Human Urines	2,3	Prelab, report	Lecture, Practice, homework	[1].20
3	Quantitative Determination of Protein and Sugar in Human Urines	2,3	Prelab, report	Lecture, Practice, homework	[1].9, 12
4	Quantitative Determination of Urea in Human Urines	2,3	Prelab, report	Lecture, Practice, homework	[1].16
5	Quantitative Determination of Creatinine in Human Urines	2,3	Prelab, report	Lecture, Practice, homework	[1].18

6	Quantitative Determination of Minerals in Human Urines	2,3	Prelab, report	Lecture, Practice, homework	[1].21
7	Field trip	1, 3	Prelab, report	Lecture, instruction	
8	Examination				

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
Prelab (30%)	x		
Report (40%)	x	x	x
Final exam (30%)	x	x	x

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

5. Rubrics (optional)

1. 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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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.

2. 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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable

	consistently observable and is skillful and makes the content of the presentation cohesive.	consistently observable within the presentation.	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 the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the 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 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 establishes the presenter's	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.	credibility/ authority on the topic.	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

6. Date revised: May 27, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY

School of Biotechnology

COURSE SYLLABUS

Course Name: Human Physiology

Course Code: **BT210IU**

1. General information

Course name	- (in English) <i>Human Physiology</i> - (in Vietnamese) <i>Sinh lý người</i>
Course designation	<i>This course is designed to help further student's understanding of the physiology function of human, particularly from cells to body systems. The principal goal is to learn about the function & regulation of the human body and physiological integration of the organ systems to maintain homeostasis. Students examine the mechanisms of body function, organized around the central theme of homeostasis – how the body meets changing demands while maintaining the internal constancy necessary for all cells and organs to function. Course content will include neural & hormonal homeostatic control mechanisms, as well as study of the cell physiology, plasma membrane and membrane potential, circulatory, respiratory, urinary, immune, reproductive physiology, and endocrine organ systems. The lecture also provides to students the applications of human physiology on advanced research for regenerative biomedicine, cell therapy and assisted reproductive for human.</i>
Course type	☐ General knowledge ☐ Fundamental ☒ Specialized knowledge ☐ Internship/Project/Thesis ☐ Others:
Semester(s) in which the course is taught	6,7,8
Person responsible for the course	Assoc. Prof. Nguyen Van Thuan Email: nvthuan@hcmiu.edu.vn
Language	English
Relation to curriculum	☐ Compulsory ☒ Elective

m							
Teaching methods	Lecture, Quiz, Homework.						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		Credit	3				
	Contact hours	37.5	37.5	0			
	Self-Study hours	90	90	0			
	Total workload	127.5	127.5	0			
Credit points	3 credits (4.62 ECTS)						
Required and recommended prerequisites for joining the course	Introduction to Biochemistry						
Course objectives	The course provides students with basic understanding and advanced concepts of human physiology for applications in stem cell therapy, assisted reproductive technology, and regenerative biomedicine for human.						
Course learning outcomes	Upon the successful completion of this course students will be able to:						
	Competency level	Course learning outcome (CLO)					
	Knowledge	CLO1. Understanding functions and mechanisms of the cells. CLO2. understanding of the fundamental physiological processes of homeostasis, nervous system, urinary system, respiratory system, circulatory system, reproductive system, and endocrine organ systems.					
	Skill	CLO3. Protect body from environmental change, applications of assisted reproductive technology and cell therapy for human. Developed and understanding of the structure and function of the primary body systems indicated.					
	Attitude	CLO4. have developed a curiosity and wonder of the complexity of the human body and the confidence to continue learning and questioning. Have demonstrated self-direction and initiative in their learning					
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 of human physiology and homeostasis - Course outline	1	I, T
	Cell physiology: Principles of the cell theory - General cell structure - Plasma membrane - Organelles of cells	2	I, T
	Cell physiology: The basic events during preimplantation development - The cell cycle and application -	2	I, T
	Telomeres and aging: Applications	1	T, U
	The plasma membrane and membrane potential	1	I, T, U
	The central nervous system and neural - hormonal communication	2	I, T, U
	Cardiac physiology and the urinary system	1	T, U
	Principles of endocrinology	2	T, U
	The reproductive system	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	Textbook: [1] <i>Human Physiology: From Cells to Systems</i> (Lauralee Sherwood), 9th edition. Book Reference: [1] <i>Animal Physiology: from Genes to Organisms</i> (Lauralee Sherwood, Hillar Klandorf, and Paul H. Yancey); 2nd edition. Article References: [3] Lecture slides (receive from instructor) via Backboard		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-8) is shown in the following table:

	ILO							
CL O	1	2	3	4	5	6	7	8
1		L						
2			L					
3					M			

4							H	

3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessments	Learning activities	Resources
1	Introduction to human physiology - Course outline	1- 4		Lecture, Discussion, In Class-Quiz	1, 2, 3
2	Cell physiology: - Embryo: the basic events during preimplantation development - The cell cycle and applications	1		Lecture, Discussion, In Class-Quiz	1, 2
3	Telomeres and aging	1, 2		Lecture, Discussion	1, 2

4	The plasma membrane and membrane potential	1, 2		Lecture, Discussion, In Class-Quiz	1, 2
5	Neural and hormonal communication	1, 2	HW1	Lecture, Discussion	1, 2, 3
6	The central nervous system	1, 2		Lecture, Discussion	1, 3
7	The peripheral nervous system:	2, 3		Lecture, Discussion,	1, 3
8	The eye: Vision	2, 3		Lecture, Discussion	1,3
9	Midterm				
10	Circulation system and the urinary system	1, 2		Lecture, Discussion	1, 2
11	Principles of endocrinology: - The central endocrine glands - The peripheral endocrine glands	2, 3	HW2	Lecture, Discussion,	1, 2
12	The reproductive system: Male & female reproductive physiology, functions and organs	2, 3		Lecture, Discussion, In Class-Quiz	1, 2, 3
13	The reproductive system: Spermatogenesis and oogenesis	3, 4		Lecture, Discussion,	1, 3
14	The reproductive system: Hypothalamic & pituitary control on testicular and ovarian function	3, 4		Lecture, Discussion,	1, 3
15	Assisted reproductive technology	3, 4		Lecture, Discussion, In Class-Quiz	1, 3
16-17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class Participation/ quizzes (10%)	Quiz/ Part. 80%Pass	Quiz/ Part. 80%Pass	Quiz/ Part. 80%Pass	Quiz/ Part. 80%Pass
Homework exercises (10%)	HW1 80%Pass		HW2 80%Pass	

Midterm exam (40%)	Part I. 60% Pass	Part II. Q1,2 60% Pass	Part II. Q3,4 60% Pass	
Final exam (40%)		Part I. 60% Pass	Part II. Q1,2 60% Pass	Part II. Q3,4 60% Pass

Note: %Pass (Exam): % students have scores greater than 50 out of 100.

%Pass (Presentation/ Assignment): % students have scores greater than 70 out of 100.

6. Date revised: March, 2024

DEAN OF SCHOOL OF BIOTECHNOLOGY



Assoc. Prof. NGUYEN VAN THUAN



VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY
 School of Biotechnology
 Department of Applied Chemistry

COURSE SYLLABUS

Course Name: The chemistry of surfaces and interfaces

Course Code: BTBC424IU

6. General information

Course name	- (in English)... <i>The chemistry of surfaces and interfaces...</i> - (in Vietnamese)... <i>Hóa bề mặt...</i>
Course designation	... <i>This course is a combination of a classical lecture component and a research/ application assignment. Besides attending the lecture will be required to prepare a term paper addressing the specific method of colloid/surface characterization and its applications to real system. You will present your individual research as a Power Point talk at the end of the semester. A midterm and a final exam are planned.</i>
Course type	☐ <i>General knowledge</i> ☐ <i>Fundamental</i> ☒ <i>Specialized knowledge</i> ☐ <i>Internship/Project/Thesis</i> ☐ <i>Others:</i>
Semester(s) in which the course is taught	7,8
Person responsible for the course	Associate Professor Nguyễn Tấn Khôi
Language	English
Relation to curriculum	☐ <i>Compulsory</i> ☒ <i>Elective</i>
Teaching methods	Lecture, case studies

Workload (incl. contact hours, self- study hours)			Lecture	Lab			
		<i>Credit</i>	3				
	Contact hours	37.5	37.5	0			
	Self-Study hours	90	90	0			
	Total workload	127.5	127.5	0			
Credit points	3 credits (4.62 ETCS)						
Number of periods	Theory: 3 Practice: 0						
Required and recommended prerequisites for joining the course	- Prerequisites: BT405IU -Physical Chemistry						
Course objectives	Colloid and Surface Chemistry is intended to broaden the students understanding of chemical processes taking place in colloidal systems and on the surfaces of solids.. This course draws upon physical chemistry and chemical thermodynamics experience. The knowledge of calculus is also required						
Course learning outcomes	Upon the successful completion of this course students will be able to:						
	Competency level	Course learning outcome (CLO)					
	Knowledge	CLO1. Know the basic processes in which colloids and surfaces are involved. CLO2. Know the thermodynamics of colloid phenomena in solutions CLO3. Be able to describe in chemistry/thermodynamic terms the processes occurring on the surfaces. CLO4. Be aware how various colloid/surface parameters are linked and used to understand surface phenomena CLO5. Be able to evaluate the importance of colloid and surface chemistry for modern industry and real life applications					
	Skill	CLO6. Work as part of a team presenting the details of the characterization methods and studies on real systems.					
	Attitude	CLO7. Be able to search data bases to extract the needed information and confidently present it in a concise form					

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	1. Colloid and Surface Chemistry: The scope	1	T, U
	2. Sedimentation and Diffusion and Their Equilibrium	1	T, U
	3.Solution Thermodynamics: osmotic equilibria	1	T, U
	4. The viscosity of dilute dispersions	1	T, U
	5. Light scattering	2	T, U
	6. Surface tension and contact angle	1	I, T
	7.Adsorption from Solution	1	T, U
	8. Colloidal Structures in Surfactant solutions	2	T, U
	9. Physical adsorption at the gas-solid interface	2	T, U
	10. Van der Waals attractions and flocculations	2	T, U
	11.Electrophoresis and other electrokinetic phenomena	1	T, U
Examination forms	Written		
Study and examination requirements	<i>Besides attending the lecture will be required to prepare a term paper addressing the specific method of colloid/surface characterization and its applications to real system. You will present your individual research as a Power Point talk at the end of the semester. A midterm and a final exam are planned</i>		
Reading list	<i>TEXT BOOK: Principles of Colloid and Surface Chemistry; Paul C. Himenez.Marcel Dekker....</i> • <i>Colloids and surfaces</i> • <i>Surface science</i> • <i>Journal of Colloid and Interface science</i> • <i>Applied Surface Science</i> • <i>Journal of Physical Chemistry</i> • <i>Langmuir</i>		

7. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) and Program/Student Learning Outcomes (PLO) is shown in the following table:

	PLO							
CLO	1	2	3	4	5	6	7	8
1			M					

2			M					
3	M		M					
4	M		M			L		
5						H	M	
6	M					M		
7			M				M	

**Use Bloom's Taxonomy*

8. Planned learning activities and teaching methods

Week	Topic	CLO	Learning activities	Assessments	Resources
1	1. Colloid and Surface Chemistry: The scope	CLO1, CLO2	5%	- Lecture presentation - Group forming. - Class discussion - Read book & lecture 2.	
2	2. Sedimentation and Diffusion and Their Equilibrium	CLO1, CLO3, CLO4	5%	- Lecture presentation - Class discussion - Read book & lecture 3.	
3	3. Solution Thermodynamics: osmotic equilibria	CLO1, CLO3, CLO4	10%	- Lecture presentation - Class discussion - Read book & lecture 4.	
4	4. The viscosity of dilute dispersions	CLO1, CLO2, CLO3, CLO4	10%	- Class discussion - Read book & lecture 5.	
5,6	5. Light scattering	CLO1, CLO2	10%	- Lecture presentation - Class discussion - Read book & lecture 6.	
7	6. Surface tension and contact angle	CLO1, CLO2	10%	- Lecture presentation - Class discussion - Read book & lecture 7	
8	7. Adsorption from Solution	CLO1, CLO2, CLO3	10%	Lecture presentation - Class discussion - Read book & lecture 8	
Midterm					
9,10	8. Colloidal Structures in Surfactant solutions	CLO1, CLO2	15%	- Lecture presentation - Class discussion - Read book & lecture 9.	
11,12	9. Physical adsorption at the gas-solid interface	CLO1, CLO2, CLO4, CLO5	15%	- Lecture presentation - Class discussion - Read book & lecture 10.	

13,14	10. Van der Waals attractions and flocculations	CLO1, CLO2	10%	- Lecture presentation - Class discussion	

9. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO 5	CLO 6	CLO 7
Written exam (70%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Term paper (20%)	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass	50%Pass
Class participation/presentation (10%)	70%Pass	70%Pass	70%Pass	70%Pass	70%Pass	70%Pass	70%Pass

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

10. Rubrics

11. Date revised: March 2024

DEAN OF SCHOOL OF BIOTECHNOLOGY



Assoc. Prof. NGUYEN VAN THUAN



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology

COURSE SYLLABUS

Course Name: Molecular Diagnostics

Course Code: BT351IU

1. General information

Course name	- (in English) <i>Molecular Diagnostics</i> - (in Vietnamese) <i>Chuẩn đoán phân tử</i>
Course designation	<i>The molecular diagnostics course is an applied course, using molecular biotechnology using both protein and nucleic-acid-based methods in diagnosis of the infectious diseases in human, plant, animal, and food as well as the identify genetic causative or risks contributing to diseases. The molecular techniques are reviewed and studied to apply them as the diagnosis tools, also the troubleshooting for diverse technical applications. The course gives the approach to develop new or advance methods for diagnosis of the diseases based on the principle of molecular biotechnology. The applications in detection of target infectious disease or genetic or somatic causative/risk variants will be introduced and discussed.</i>
Course type	☐ General knowledge ☐ Fundamental ☒ Specialized knowledge ☐ Internship/Project/Thesis ☐ Others:
Semester(s) in which the course is taught	6,7,8
Person responsible for the course	Dr. Le, Minh Thong
Language	English
Relation to curriculum	☐ Compulsory ☒ Elective
Teaching methods	Classroom activities: Lecturing, question – answer, discussion Self-learning: Reading, homework Teamwork: Group assignment, presentation

Workload (incl. contact hours, self- study hours)			Lecture	Lab				
		<i>Credit</i>	3					
	Contact hours	37.5	37.5	0				
	Self-Study hours	90	90	0				
	Total workload	127.5	127.5	0				
Credit points	3 credits (4.62 ECTS)							
Required and recommended prerequisites for joining the course	Molecular Cell Biology (BTBC218IU)							
Course objectives	Upon complete this course the successful students will be able to: - Understand the classification of risks to human activities such as: production, food, healthcare, ... and the needs to use molecular technologies for diagnostics. - Understand the principle of molecular methods used in the specific context for effective diagnostics.							
Course learning outcomes	Upon the successful completion of this course students will be able to:							
	Competency level	Course learning outcome (CLO)						
	Knowledge	CLO1. Have a understand of the classification of risks to human activities. CLO2. Have an understanding molecular technique: principles and specific context utilization for diagnostics						
	Attitude	CLO3. Discerning the importance, ethical and privacy issues in molecular testing.						

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	1 – Introduction of Molecular diagnostics and traditional diagnosis methods	1	I
	2 - Classification of the risks and the need of using molecular diagnostics & Quality Assurance and Quality Control in the Molecular Laboratory	1	I, T
	3 - Protein based technologies	1	I, T
	4 - Low- and Medium-Throughput Variant Detection Methods	1	
	5 - Quantitative Polymerase Chain Reaction and High-Resolution Melting Curve Analysis for Molecular Diagnostics	1	I, T
	6 - Molecular Cytogenetics in Molecular Diagnostics	1	I, T
	7 - Sequencing based technologies	1	I, T
	8 - Microarray and Lab-on-a-chip technologies	1	I, T
	9 - DNA Polymorphisms and Human Identification	1	I, T
	10 - Detection and Identification of Microorganisms	1	I, T
	11 - Molecular Detection of Inherited Diseases	1	I, T
	12 - Molecular Oncology	1	I, T
	13 - DNA-Based Tissue Typing	1	I, T
	14 - Preimplantation Genetic Diagnosis and Noninvasive Cell-Free DNA Prenatal Testing for Fetal Aneuploidy	1	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 based on their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	Textbook(s) [1] Lela Buckingham and Maribeth L. Flaws (2007). <i>Molecular Diagnostics: Fundamentals, Methods and Clinical Applications</i>. [2] Patrinos, George P., Wilhelm Ansorge, and Phillip B. Danielson, eds. <i>Molecular Diagnostics</i>. 3 editions. Amsterdam: Academic Press, 2016. [3] William B. Coleman, Gregory J. Tsongalis (2006). <i>Molecular Diagnostics: For the Clinical Laboratorian</i>.		

2. Learning Outcomes Matrix (optional)

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

	SLO							
CLO	1	2	3	4	5	6	7	8
1	L							
2		M						

3					M			

3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessments	Learning activities	Resource s
1	Introduction of Molecular diagnostics and traditional diagnosis methods	1		Lecture, Discussion ,	[1], 1
2	Classification of the risks and the need of using molecular diagnostics & Quality Assurance and Quality Control in the Molecular Laboratory	1	Presentation	Lecture, Discussion ,	[1], 2
3	Protein based technologies	2, 4	Presentation Quiz1	Lecture, Discussion ,	[1], 11
4	Low- and Medium-Throughput Variant Detection Methods	2, 3	Presentation	Lecture, Discussion ,	[2], 3
5	Quantitative Polymerase Chain Reaction and High-Resolution Melting Curve Analysis for Molecular Diagnostics	2, 3	Presentation	Lecture, Discussion ,	[1], 6
6	Molecular Cytogenetics in Molecular Diagnostics	2, 3	Presentation Quiz2	Lecture, Discussion ,	[1], 7
7	Sequencing based technologies	2, 3	Presentation	Lecture, Discussion ,	[1], 8, 9
8	Midterm				
9	Microarray and Lab-on-a-chip technologies	2, 3	Presentation	Lecture, Discussion ,	[2], 11, 18
10	DNA Polymorphisms and Human Identification	2, 3	Presentation Quiz3	Lecture, Discussion ,	[1], 11
11	Detection and Identification of Microorganisms	2, 3	Presentation	Lecture, Discussion ,	[1], 12
12	Molecular Detection of Inherited Diseases	2, 3	Presentation	Lecture, Discussion ,	[1], 13
13	Molecular Oncology	2, 3	Presentation Quiz4	Lecture, Discussion ,	[2], 14
14	DNA-Based Tissue Typing	2, 3, 4	Presentation	Lecture, Discussion ,	[1], 15
15	Preimplantation Genetic Diagnosis and Noninvasive Cell-Free DNA Prenatal Testing for Fetal Aneuploidy	5	Presentation	Lecture, Discussion ,	[2], 23, 24
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class quizzes/presentation (15%)	Qz1 70 % Pass		Presentation 70 % Pass	
Homework exercises (15 %)		HW1 80 % Pass		
Midterm exam (30%)	60 % Pass	60 % Pass	60 % Pass	
Final exam (40%)	60 % Pass	60 % Pass	60 % Pass	60 % Pass

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

5. Date revised: March, 2023**DEAN OF SCHOOL OF BIOTECHNOLOGY**

Assoc. Prof. NGUYEN VAN THUAN

Course designation	This course is developed to provide the principal concept on project management which was characterized by the project management body of knowledge guide (PMBOK Guide). This guide emphasizes the five project process groups of initiating, planning, executing, controlling and closing, and the nine knowledge areas of project integration, scope, time, cost, quality, human resources, communication, risk, and procurement management.						
Semester(s) in which the course is taught	5,6,7,8						
Person responsible for the course	Tran Van Ly						
Language	English						
Relation to curriculum	Elective						
Teaching methods	Lecture, homework.						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	3				
Contact hours	37.5	37.5	0				
Self-Study hours	90	90	0				
Total workload	127.5	127.5	0				
Credit points	3 credits (4.62 ECTS)						
Required and recommended prerequisites for joining the course	None						
Course objectives	Students will be provided with knowledge and skills of constructing the network (AON & AOA), GANNT Chart, solving the network; Resource allocation, resource loading & leveling; Project budgeting & cost estimation, risk management; Project quality management; Project human resource management; Project procurement management; Project executing, monitoring & control to closing the project						

Course learning outcomes	Upon the successful completion of this course students will be able to:		
	Competency level	Course learning outcome (CLO)	
	Knowledge	CLO1. Able to align the project to the organization's strategic plans and business justification throughout its lifecycle; to identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders. CLO2. Able to manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders Able to Implement general business concepts, practices, and tools to facilitate project success.	
	Skill	CLO3. Work effectively in group projects in a specific context; combining the techniques to conduct practical cases. Respond to the needs of community and industrial sectors	
	Attitude	CLO4. Able to Apply appropriate legal and ethical standards. Adapt project management practices to meet the needs of stakeholders from multiple sectors of the economy (i.e. consulting, government, arts, media, and charity organizations); Identify and follow strictly ethical disciplines in project management	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight	Level
	Lecture 1: Introduction to Project Management	1	I, T
	Lecture 2: Project management processes for a project	1	I, T
	Lecture 3: Work breakdown structure	1	I, T
	Lecture 4: Project scheduling	1	I, T
	Lecture 5: Resource allocation	1	I, T
	Lecture 6: Logical Framework	2	I, T
	Lecture 7: Project cost management	1	I, T
	Lecture 8: Project risk management	1	I, T
	Lecture 9: Project quality management	1	I, T
	Lecture 10: Project human resource management	1	I, T

	Lecture 11: Project procurement management	1	I, T
	Lecture 12: Project executing, monitoring & control.	1	I, T
	Lecture 13: Project closing	1	I, T
Examination forms	Short-answer questions, exercises		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	[1] Book name: A Guide to the project management body of knowledge (PMBOK® Guide). 5th Edition, Newtown Square, Pa. : Project Management Institute, Inc. [2] Project management: A managerial approach / Jack R. Meredith, Samuel J. Mantel. 7th Edition, Hoboken, N.J. : Wiley ; Chichester : John Wiley [distributor], 2009. [3] The project management life cycle/ Jason West land. Kogan Page Limited, 2006		

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	M							
2		M						
3								M
4					M			

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Introduction to Project Management, project life cycle and organization	1		Lecture, Group work	[1].
2	Lecture 2: Project management processes for a project - Common project management process interactions. - Project management process groups. - Initiating process group - Planning process group	1	HW 1	Lecture, Group work	[1].

3	Lecture 3: Work breakdown structure	1,3,4	HW 2	Lecture, Group work	[1].
4	Lecture 4: Project scheduling. - Constructing the network: AON & AOA - Gantt chart - Solving the network - Using Microsoft Project software	1,3,4	HW 3	Lecture, Group work	[1].
5	Lecture 5: Resource allocation - Critical path method – Crashing a project - Resource allocation problem - Resource loading - Resource leveling - Constrained resource scheduling	1,3,4	HW 4	Lecture, Group work	[1].
6 & 7	Lecture 6: Logical Framework Approach (LFA)	3		Lecture, Group work	[1].
8	Review for Midterm				
	Midterm				
9	Lecture 7: Project cost management Project budgeting & Cost estimation - Top-Down budgeting - Bottom-Up budgeting - Improving the process of cost estimation	2, 3, 4	HW 5	Lecture, Group work	[1].
10	Lecture 8: Risk management. - Risk management planning - Risk identification - Risk analysis - Risk monitoring and control - Using Crystal Ball software		HW 6	Lecture, Group work	
11	Lecture 9: Project quality management - Plan quality - Perform quality assurance - Perform quality control	2, 3, 4	HW 7	Lecture, Group work	[1].
12	Lecture 10: Project human resource management - Develop human resource plan - Acquire project team - Develop project team	2, 3, 4	HW 8	Lecture, Group work	[1].

	Manage project team				
13	Lecture 11: Project procurement management - Plan procurements - Conduct procurements - Administer procurements - Close procurements	2, 3, 4	HW 9	Lecture, Group work	[1].
14	Lecture 12: Project executing, monitoring & control.	2, 3, 4	HW 10	Lecture, Group work	[1].
15	Lecture 13: Project closing Project Presentation Review for Final Exam	2, 3, 4		Problems solving Group work	[1].
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Homework exercises (30%)	HW1-2 50%Pass	HW4, HW5, HW6 50%Pass	HW7-8 50%Pass	HW9-10 50%Pass
Midterm exam (30%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	
Final exam (40%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	

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

5. Rubrics (optional)

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%)			
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 the task are included.
3	Demonstrates partial understanding of the problem. Most requirements of the task are included.
2	Demonstrates little understanding of the problem. Many requirements of the 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 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 <i>Selecting and using information to investigate a point of view or conclusion</i>	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 one's 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

Organiza tion	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.
Languag e	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to the audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to the audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and the speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and the speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.
Supporti ng Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports

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

Source: Association of American Colleges and Universities

6. Date revised: May, 2023

School of Industrial Engineering and Management

Course Code: **BA164IU**

Course designation	<i>This subject will provide students with sound theoretical and pragmatic approaches that will guide them in the formulation and implementation of corporate, business, and functional strategies.</i>						
Semester(s) in which the course is taught	5,6,7,8						
Person responsible for the course	Dr. Truong Quang Duoc Nguyen Nhu Ty						
Language	English						
Relation to curriculum	<i>Elective</i>						
Teaching methods	<i>Lecture, Tutorial, Presentation, Field Trip</i>						
Workload (incl. contact hours, self-study hours)			Lecture	Lab			
		<i>Credit</i>	3				
Contact hours	37.5	37.5	0				
Self-Study hours	90	90	0				
Total workload	127.5	127.5	0				
Credit points	3 credits (4.62 ECTS)						
Required and recommended prerequisites for joining the course	None						
Course objectives	● To gain understanding of the role of operations manager in organization ● To identify and explain how operation managers make decisions which are related to operation management, such as: Product design, location planning, scheduling, inventory management...						

	● To understand how operations management related to other functional areas in an organization such as: marketing, finance /accounting and personnel ● To gain the knowledge and skills to maintain the competitive advantage for an organization by improving better productivity, reducing cost, responding more quickly to the demand and providing better quality	
Course learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	Course learning outcome (CLO)
	Knowledge	CLO1. Apply the quantitative techniques to support the Operations Manager in making his or her decisions in realistic situations (problem solving skills)
	Skill	CLO2. Explain real problems/ factors which affect on the organizations and develop their recommendations (Bloom 2) CLO3. Analyze an operation process in both written and spoken forms. (Bloom 4)
	Attitude	CLO4. Having overall perspectives of global Operations management to obtain sustainable business
Content	BA164IU– Production and Operations Management which is to present a broad introduction to the field of operations in a realistic, practical manner includes a blend of topics from accounting, industrial engineering, management, management science, and statistics. Therefore, the students will have a better understanding of the role of operations in different functional departments of a firm. In that connection, other foundation courses such as Management, Accounting, Marketing, Human Resource Management and some specialized courses (Project Management, Quality Management) are also very useful in terms of supporting this course.	
Examination forms	Open or closed questions Open-ended questions	
Study and examination requirements	To pass this course, the students must: ● Achieve a composite mark of at least 50; and ● Make a satisfactory attempt at all assessment tasks (see below). GRADING POLICY Grades can be based on the following:	
	Group Presentation	15%
	Individual Assignment	15%

Midterm examination	25%
Final examination	45%
Total	100%

COURSE POLICIES

Attendance

Your regular and punctual attendance at lectures and related seminars (if any) is expected in this course. University regulations indicate that if students attend less than 80% of scheduled classes they may be refused final assessment. Exemptions may only be made on medical grounds.

Regular attendance is essential for successful performance and learning in this course, particular in view of the interactive teaching and learning approach adopted. Please inform your lecture if you are unable to attend the class, and arrange for a classmate to collect any handouts.

Workload

It is expected that you will spend at least 6 hours per week studying this course. This time should be made up of reading, working on exercises and problems, group assignments and attending class lectures and tutorials. In periods where you need to complete assignments or prepare for examinations, the workload may be greater.

General Conduct and Behaviour

You are expected to conduct yourself with considerable and respect for the needs of your fellow students and teaching staff. Conduct that unduly disrupts or interferes with a class, such as ringing, or talking on mobile phones, or chatting on the internet, is not acceptable and students may be asked to leave the class.

Keeping informed

You should take note of all announcements made in lectures, tutorials or on the course website. From time to time, the University will send important announcements to you through website, course website and/or Announcement Board (of School of Business and/ or Academic Affairs) without providing you with a paper copy. You will be deemed to have received this information.

Academic honesty and plagiarism

The University regards plagiarism as a form of academic misconduct, and has very strict rules regarding plagiarism.

Plagiarism is the presentation of the thoughts or work of another as one's own. Examples include:

- direct duplication of the thoughts or work of another, including by copying work, or knowingly permitting it to be copied. This includes copying material. Ideas or concepts from a book, article, report or other written document (whether

	published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement; - paraphrasing another person's work with very minor changes keeping the meaning, form and/ or progression of ideas of the original; - piecing together sections of the work of others into a new whole; - presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment items. 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. 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	The following text and references are essential for the course. <u>Textbook:</u> Jay Heizer and Barry Render (2009), Operations Management. Ninth Edition, Prentice Hall. (H&R) <u>References:</u> Russell and Taylor (2009), Operations Management- Creating Value Along The Supply Chain, Six Edition, John Wiley & Sons. (R&T) <u>Additional materials provided in Blackboard</u> 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 additional benefit of class interaction and demonstration. <u>Recommended Internet Resources</u> Internet resources related to the chapter materials are provided in the text books Recommended Journals

	International Journal of Operations and Production Management International Journal of Logistics Management Harvard Case Studies can be accessed via: http://harvardbusinessonline.hbsp.harvard.edu <u>Other Resources, Support and Information</u> Additional learning assistance is available for students in this course and will be made available in Blackboard. Academic journal articles are available through connections via the VNU – Central Library. Recommended articles will be duly informed to the students.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1		M						
2		M						
3								H
4	H							

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Chapter 1: Introduction and Operations & Productivity What is Operations Management Organizing to produce goods and services Why study OM What operations managers do Operations in the service sector Exciting new trends in Operations Managements	1; 2; 3; 4;		Lecturing Discussion	Instructor Manual, Teacher's Resource

	Issues in Operations strategy Global Operations Strategy Options Productivity				
2	Chapter 2: Operations strategy in global environment A global view of Operations Developing missions and strategies Achieving competitive advantage thru Operations ▪ Review productivity (15 mins): Rapid Review; Homework solving ▪ Lecture (combined with Q&A, brainstorming, and activity after every 15 min): 60 min ▪ Q&A and queries: 15 min	3; 4;		Presentations Lecturing Discussion	Case-study, Teacher's Resource
3	Chapter 4: Design of Goods and services Goods and services selection Generating new product Product development Issues for product design Defining product	1; 2; 3; 4;		Presentations Lecturing Discussion	Instructor Manual, Teacher's Resource (Handouts)

	Documents for production Service design				
4	Chapter 6: Managing Quality Quality and Strategy Defining Quality International Quality Standards Total Quality Management Tools of TQM The Role of Inspection TQM in services ▪ Lecture (combined with Q&A, brainstorming, and activity after every 15 min): 60 min Presentation Presentation	2; 3; 4;	Quiz: Drawing 7 tools for TQM	Presentations Lecturing Discussion	Instructor Manual, Teacher's Resources
5	Chapter 7: Process Strategy Four process strategies Process Analysis and design Service process design Production Technology Process Decision ▪ Review Managing Quality: 15 min Lecture (combined with Q&A, brainstorming, and activity after every 15 min): 60 min	1 2; 3; 4;	Quiz: Break point even analysis	Presentations Lecturing Discussion	Instructor Manual, Teacher's Resource (Handouts)

	▪ Q&A and queries: 15 min				
6	Chapter 7s: Capacity Planning Capacity Capacity planning Break-even analysis Applying decision trees to capacity decisions Strategy –driven investments ▪ Review Process Strategy: 15 min	3; 4;		Presentations Lecturing Discussion	Case-study, Teacher's Resource
7	Chapter 8: Location Strategies The strategic importance of location Factors that affect location decisions Methods of evaluating location alternatives Service location strategy	3; 4;		Presentations Lecturing Discussion	
8	Midterm				
9	Chapter 9: Layout Strategy The strategic importance of layout decisions Types of layout Fixed-position layout Process-oriented layout Office layout Retail layout Warehousing and storage layouts	1 2; 3; 4;	Exercises	Presentations Lecturing Discussion	

	Repetitive and product –oriented layout ▪ Review: 15 min ▪ Lecture (combined with Q&A, brainstorming, and activity after every 15 min): 60 min ▪ Q&A and queries: 15 min				
10	Chapter 11: Supply Chain Management The strategic importance of the supply chain Supply-chain economics Supply-chain strategies Logistic management ▪ Review: 15 min	1 2;		Presentations Lecturing Discussion	Instructor Manual, Teacher's Resource
11	Chapter 12: Inventory Management Function of inventory Inventory management Inventory models Inventory models for independent demand	1 2; 3; 4;		Presentations Lecturing Discussion	Instructor Manual, Teacher's Resource Explain and use models for managing inventory with independent demand including EOQ, POQ and quantity discount
12	Chapter 14: Material Requirement Planning & Enterprise Resource Planning -MRP and ERP	1 2; 3; 4;	Quiz	Presentations Lecturing Discussion	Instructor Manual, Teacher's Resource ▪ Build material requirement

	Dependent Inventory model requirements MRP structure MRP management Lot-sizing techniques ▪ Lecture (combined with Q&A, brainstorming, and activity after every 15 min): 60 min ▪ Q&A and queries: 15 min				plan (MRP) using lot-sizing technique ▪ Understand expansion of MRP and ERP Explain how MRP works (handouts in bb)
13	Field trip	3;4	Writing report of field trip		
14	Chapter 15: Short term Scheduling The strategic importance of scheduling Scheduling issues Scheduling process-focused facilities Loading jobs Sequencing jobs Finite capacity scheduling (FCS) Scheduling repetitive facilities Scheduling service	1 2; 3; 4;		Presentations Lecturing Discussion	▪ Explain the relationship between short-term scheduling, capacity planning and master plan ▪ Apply assignment methods ▪ Use priority rules ▪ Apply Johnson's rule
15	Chapter 10: Job Design and Work Measurement Human resource strategy for competitive advantage Labor planning Job design The visual workplace	1 2; 3; 4;		Presentations Lecturing Discussion	▪ Identify major issues in designing jobs and managing labor ▪ Identify ergonomic and work environment issues

	Labor standards and work measurement Time studies Predetermined time standards Work sampling ▪ Review: 15 min ▪ Lecture (combined with Q&A, brainstorming, and activity after every 15 min): 60 min ▪ Q&A and queries: 15 min				▪ Use the tools of methods analysis
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Group Presentation (15%)	100% Pass	100% Pass	100% Pass	100% Pass
Individual Assignment (15%)	90% Pass	90% Pass	90% Pass	90% Pass
Midterm examination (25%)	90% Pass	90% Pass	90% Pass	90% Pass
Final examination (45%)	90% Pass	90% Pass	90% Pass	90% Pass

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

5. Rubrics (optional)

6. Date revised: May, 2023

GRADING RUBRIC FOR WRITTEN COURSEWORK

MIDTERM EXAMINATION – Subject (ID subject)

Academic year: 2022 – 2023 (term ...)

Criteria	INADEQUATE 10% – 49%	ADEQUATE 50% - 59%	ABOVE AVERAGE 60% - 74%	EXEMPLARY ≥ 75%

Organization and clarification	Does not organize ideas logically and with clarification. Limited evidence of coherence Ideas lack consistency	Generally organized 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
Originality and usefulness of the analysis	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 facts 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
Use of data/information	Shows little information from sources. Poor handling of sources	Shows moderate amount of source information incorporated. Some key points supported by sources. Quotations may be poorly integrated into paragraphs. Some possible problems with source citations	Draws upon sources to support most points. Some evidence may not support arguments or may appear where inappropriate. Quotations integrated well into paragraphs. Sources cited correctly	Draws upon primary and secondary source information in useful and illuminating ways to support key points. Excellent integration of quoted material into paragraphs. Source cited correctly

Use of 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
Quality of arguments	Shows little attempt to offer support for key claims or to relate evidence to analysis. The reasons offered are irrelevant.	Shows arguments 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.

GRADING RUBRIC FOR WRITTEN COURSEWORK

MIDTERM EXAMINATION –

Academic year:

Criteria	COMPLETELY FAIL Below 30%	INADEQUATE 30% – 49%	ADEQUATE 50% - 69%	ABOVE AVERAGE 70% - 89%	EXEMPLARY ≥ 90%
Organization and clarification	No evidence of organization and coherence	Does not organize ideas logically and with clarification Limited evidence of coherence Ideas lack consistency	Generally organized 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

Originality and usefulness of the analysis	Shows no ability to identify issues or a clear inability to gather the facts	Demonstrate an incomplete grasp of the task. There is no overall sense of creative coherence. Arguments are addressed incompletely.	Shows ability to identify issues, gather the facts and develop claims. Argument are addressed well but no links with evidence	Shows strong ability to identify issues, gather the facts and develop claims as well as link claims with evidence. Overall, an acceptable solution is offered and explained	Shows strong ability to identify issues, gather the facts and develop claims as well as link claims with evidence. Satisfactory solutions are offered and supported
Use of data/information	Shows no effort to incorporate information from primary and secondary sources	Shows little information from sources. Poor handling of sources	Shows moderate amount of source information incorporated. Some key points supported by sources. Quotations may be poorly integrated into paragraphs. Some possible problems with source citations	Draws upon sources to support most points. Some evidence may not support arguments or may appear where inappropriate. Quotations integrated well into paragraphs. Sources cited correctly	Draws upon primary and secondary source information in useful and illuminating ways to support key points. Excellent integration of quoted material into paragraphs. Source cited correctly
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.	Shows ability to structure problems in correspondence to theoretical frameworks correctly.	Shows ability to structure problems in correspondence to theoretical frameworks correctly.

			There are still some mistakes	Minor mistakes in resolving problems	The problems are well resolved
Quality of arguments	Shows no effort to construct logical arguments. Fails to support analysis	Shows little attempt to offer support for key claims or to relate evidence to analysis. Reasons offered are irrelevant.	Shows arguments 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.

Date revised: May, 2023

School of Business

	VIETNAM NATIONAL UNIVERSITY HCMC INTERNATIONAL UNIVERSITY School of Industrial Engineering & management	Code: FormCS1/EV. Issued No: 1.20 Date of issued: 25/02/2020 Total pages: ...

COURSE SYLLABUS

**Course Name: Logistics Engineering & Supply Chain
Design**

Course Code: IS078IU

RECORD OF REVISIONS

No.	Place	Content of revision	Date of revision

	Prepared by	Reviewed by	Approved by
Full name	Nguyen Hoang Huy		
Position	Lecturer		
Signature			
Date	.../03/2020		

1. General Information

- Course Title
- + Vietnamese: Kỹ Thuật Thiết Kế Chuỗi Cung Ứng và Logistics
- + English: Logistics Engineering & Supply Chain Design
- Course ID: IS078IU
- Course type
 - ☐ General
 - ☒ Specialization
 - ☐ Skills
 - ☐ Fundamental
 - ☐ Others:...
 - ☐ Project/ Internship/ Thesis
- Number of credits: 3
- + Lecture: 3
- + Laboratory: 0
- Prerequisites: Deterministic Models in

OR

- Parallel Course: Nil
- Previous course: Nil

2. Course Description

This course aims to

- Develop an understanding of concepts and key points of Supply Chain Management.
- Develop an understanding of Logistics and Supply Chain structure, and how to design an effective supply chain.
- Formulate and solve problems related to logistics and supply chain with optimization techniques.

3. Textbooks and Other Required Materials (*textbooks and references should be ≤ 5*)

Textbooks:

- Simchi-Levi, D., Kaminsky, P., and Simchi-Levi, E. (2008). Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies. Boston: McGraw-Hill/ Irwin.

References books:

- “Chopra, S., and Meindl, P. (2012). Supply chain management: Strategy, Planning and Operation, 5th ed.. NY: Prentice Hall.
- Mankiw NG (2011). Principles of Economics, 5th edition. South-Western Cengage Learning.
- Simchi-Levi, D., Chen, X., Bramel, J. (2014). The Logic of Logistics Management. Springer Series in Operations Research and Financial Engineering.

4. Course goals

Goals (Gx)	Descriptions	Program Learning Outcomes		Level of Competence
		ABET *	CDIO	

G1	Understanding of concepts and key points of Supply Chain Management.	4, 7	4.1	Apply
G2	Understanding of Logistics and Supply Chain structure, and how to design an effective supply chain	1,2	1.1, 1.2	Understand
G3	Formulate and solve problems related to logistics and supply chain with optimization techniques.	3,5	1.3, 3.1, 4.1	Analyze

** ABET Student Outcomes*

Criteria for Accrediting Engineering Programs, 2020-2021

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

5. Course learning outcomes (CLOs)

Course learning outcomes are described systematically and aligned with course goals. Active verbs are used to describe CLOs and able to measure and observe in a specific context. Teaching modes: I(Introduce); T (teach); U (Utilize).

CLOs (Gx.x)	Descriptions	Teaching Modes
G1.1	Understanding of concepts, key points and primary challenges of Supply Chain Management.	I, T

G1.2	Able to distinguish different concepts and problems in logistics and supply chain management.	T
G2.1	Know how to formulate and solve different logistics and supply chain problems by using the mathematical techniques.	T
G2.2	Know how to solve the models using computer-based software such as CPLEX, LINGO, Python, Matlab.	T, U
G3.1	Able to solve practical problems and analyze the solutions.	T

6. Course Assessment

Assessment types	Assessment component	Course learning outcomes (CLOs) (Gx.x)	Percentage %
A1.Process assessment	A1.1 Quiz	G1.1, G1.2	5
	A1.2 Homeworks	G1.1, G1.2	5
	A1.3 Project	G2.1, G2.2, G3.1	20
A2.Midterm assessment	A2.1 Midterm Exam	G1.1, G1.2, G2.1, G2.2	30
A3. Final assesement	A3.1 Final Exam	G1.1, G1.2, G2.1, G2.2	40

7. Course Content

Theory

Week	Content	CLOs (Gx.x)	Teaching and Learning activities		Assessment Activities
			Lecturer	Student	
1	Lecture 1: Introduction to Supply Chain Management	G1.1, G1.2	- Lecture presentation	- Group forming. - Class discussion - Read book & lecture 2.	
2	Lecture 2: Inventory management and Risk Pooling	G1.1, G2.1, G2.2	- Lecture presentation	- Class discussion - Read book & lecture 3.	- Quiz /HW A1.1, A1.2
3	Lecture 3: Inventory management and Risk Pooling	G1.1, G2.1, G2.2	- Lecture presentation	- Class discussion - Read book & lecture 4.	- Quiz /HW A1.1, A1.2
4	Lecture 4: Inventory	G1.1, G2.1, G2.2	- Lecture presentation	- Class discussion - Read book & lecture 5.	- Quiz /HW A1.1, A1.2

	management and Risk Pooling				
5	Lecture 5: Network Planning	G1.1, G1.2, G2.1, G2.2	- Lecture presentation	- Class discussion - Read book & lecture 6.	- Quiz /HW A1.1, A1.2
6	Lecture 6: Distribution strategies	G1.1, G1.2	- Lecture presentation	- Class discussion - Read book & lecture 7.	- Quiz /HW A1.1, A1.2
7	Review for midterm exam	G1.1, G1.2, G2.1	-Lecture presentation -Problem solving		HW A1.2
Midterm exam					A2
10	Lecture 7: Supply contracts	G1.1 G1.2	- Lecture presentation	- Class discussion - Read book & lecture 8.	- Quiz /HW A1.1, A1.2
11	Lecture 8: The value of information	G1.1 G1.2	- Lecture presentation	- Class discussion - Read book & lecture 9.	- Quiz /HW A1.1, A1.2
12	Lecture 9: Aggregate Production Planning	G1.1 G2.1, G2.2	- Lecture presentation	- Class discussion - Read book & lecture 10.	- Quiz /HW A1.1, A1.2
13	Lecture 10: Smart pricing & revenue management	G1.1, G1.2,	- Lecture presentation	- Class discussion - Read book & lecture 11.	- Quiz /HW A1.1, A1.2
14	Lecture 11: Coordinated product and supply chain design	G1.1, G2.1	- Lecture presentation	- Class discussion	- Quiz /HW A1.1, A1.2
15	Group presentation and revision for final exam	G3.1	-Oral Presentation	-Group presentation	- Project A1.3
FINAL EXAMINATION					A3

Laboratory

Week	Content	CLOs (Gx.x)	Teaching and Learning activities		Assessment Activities
			Lecturer	Student	
1					
2					

8. Course requirement and expectation

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

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

9. Instructor information

Department/Office	School of Industrial Engineering & Management-International University, VNU-HCMC
Address	A2.602 – Quarter 6, Linh Trung Ward, Thu Duc District, HCMC
Phone number	
Instructor 's name	Nguyen Hoang Huy
Email	nhhuy@hcmiu.edu.vn

Ho Chi Minh City, .../03/2020

Dean of Faculty/Department



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Biochemistry Internship

Course Code: BTBC309IU

1. General information

Course designation	- To those working at manufacturing factories: Observing and understanding the technological process of the main product(s) in the factories. Understanding the structure and operating manufacturing machines and equipment, and product QA and QC activities. - To those working at research institutes: Learning how to do a research: doing a research. Understanding research methods. Understanding analytical equipment and techniques. Operating research equipment and apparatus. Learning how to write a scientific paper. - To those working at health care service establishments: Observing and understanding procedures, regulations, structures of organizations providing health care services (clinical biochemistry, nutrition, drug preparation and development). Understanding different methods and standards.
Semester(s) in which the course is taught	6,7,8
Person responsible for the course	Assoc. Prof. Nguyen Van Thuan Email: nvthuan@hcmiu.edu.vn Academic members of SBT. IU (IU Supervisor) and On-site Supervisor
Language	English
Relation to curriculum	Major required
Teaching methods	This is a formal internship experience under an industry Site-Supervisor and apply their advanced biochemistry knowledge and training in a biochemistry laboratory.

Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: Student has to work for 2 months (160 total hours)									
Credit points	2 credits (Internship) (5.82 ECTS)									
Required for joining the course	Accumulated at least 90 Credits									
Course objectives	It is an opportunity for students to: • Gain practical experience in biochemistry processing, product development, biochemistry research and related areas. • Apply classroom knowledge to practical situations through involvement in different levels of the organization. • Evaluate their study plan and determine needed preparation for a career in Biochemistry for industry, Biochemistry for medicine and pharmacy, and Biochemistry for nutrition • Gain exposure to a company or agency and a specific area of employment to determine whether they want that area for their life's work. • Develop confidence in personal judgment and gain maturity and self-confidence. For employers, to: • Interact with students and evaluate the potential of undergraduates for full-time employment upon graduation. • Observe the quality of instructional programs of the Biochemistry Program and contribute to the IU's Biochemistry program by recommending possible adjustments in the curriculum.									
Course learning outcomes	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. Gain practical experience in biochemistry processing, product development, biochemistry research and related areas. CLO2. Develop an individual career plan and create a resume and successfully interview for a job</td></tr><tr><td>Skill</td><td>CLO3. Demonstrate employability skills; including safely and competently working in a biochemistry job CLO4. Demonstrate the academic and technical competencies of the position.</td></tr><tr><td>Attitude</td><td>CLO5. Develop confidence in personal judgment and gain maturity and self-confidence. CLO6. Develop work competencies for a specific profession or occupation and student will explore career options, and gain general work experience</td></tr></table>		Competency level	Course learning outcome (CLO)	Knowledge	CLO1. Gain practical experience in biochemistry processing, product development, biochemistry research and related areas. CLO2. Develop an individual career plan and create a resume and successfully interview for a job	Skill	CLO3. Demonstrate employability skills; including safely and competently working in a biochemistry job CLO4. Demonstrate the academic and technical competencies of the position.	Attitude	CLO5. Develop confidence in personal judgment and gain maturity and self-confidence. CLO6. Develop work competencies for a specific profession or occupation and student will explore career options, and gain general work experience
Competency level	Course learning outcome (CLO)									
Knowledge	CLO1. Gain practical experience in biochemistry processing, product development, biochemistry research and related areas. CLO2. Develop an individual career plan and create a resume and successfully interview for a job									
Skill	CLO3. Demonstrate employability skills; including safely and competently working in a biochemistry job CLO4. Demonstrate the academic and technical competencies of the position.									
Attitude	CLO5. Develop confidence in personal judgment and gain maturity and self-confidence. CLO6. Develop work competencies for a specific profession or occupation and student will explore career options, and gain general work experience									

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>
	How to apply internship course
	1. If you are going to register for the internship, you have to complete the internship Registration form. This is required of all students intending to register for an internship.
	2. Students have to identify the internship opportunities by him/herself or with assistance from the Academic Advisor and faculty members of the department of Applied Chemistry.
	3. Students have to work at organizations providing health care services, research institutes and biochemistry industry for a period of 2 months.
	4. Students have to Fill the Form of Internship Confirmation after completion of the internship period with signature of the On-site Supervisor and submit it to the School of Biotechnology.
	5. Students have to write and submit the Internship Report, following the Report requirements. In general, the report should be at least 10 pages in lengths, and be submitted latest 4 weeks after student return from the internship place
	6. Students present the results of the internship to an internship committee consisting of 3 academic members of the department of applied chemistry.
Examination forms	Oral presentation
Internship presentation requirements	Students must receive comments from the On-site Supervisor and approval by BT.IU supervisor.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-6) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1			M	H		M		
2							M	
3					M	H		H

4	M	H	M					
5							H	
6		M						H

3. Course Evaluation:

Methods	Frequency	(%)
Report	1	35
Presentation	1	30
Evaluation from Site-Supervisor	1	35
Total		100

4. Grading system by 100-point scale and equivalent scales:

Rank	100-point scale	4-point scale	Letter A, B scale
Passed			
Excellent	$85 \leq \text{O.A.} \leq 100$	4.0	A
Very Good	$75 \leq \text{O.A.} < 85$	3.75	A-
Good	$65 \leq \text{O.A.} < 75$	3.5	B+
Lower Good	$60 \leq \text{O.A.} < 65$	3.0	B
Upper Average	$55 \leq \text{O.A.} < 60$	2.5	C+
Average	$50 \leq \text{O.A.} < 55$	2.0	C
Failed			
Weak	$30 \leq \text{O.A.} < 50$	1.3	D+
Very weak	$10 \leq \text{O.A.} < 30$	1.0	D
Too weak	$\text{O.A.} < 10$	0	F

Note: O.A. = overall average

5. Plan for consultancy, support to students:

- Student to send a report to and get advice from his/her Academic Adviser on a weekly basis.

6. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận



**VIETNAM NATIONAL UNIVERSITY HCMC
INTERNATIONAL UNIVERSITY**
School of Biotechnology
Department of Applied Chemistry

COURSE SYLLABUS

Course Name: Thesis

Course Code: BT179IU

1. General information

Course designation	<i>The research project is to give students an opportunity to deepen their theoretical knowledge by applying theory into practice. The studies also develop students' analytical skills, project management skills, social skills, and their ability to participate in Research and Development (R&D) work. The aim of the thesis is to provide students with practice on how to undertake original research in the major fields offered by the School of Biotechnology, International University (IU). By the end of the research project, students will have gained experience in conducting independent research and should be capable of it.</i>
Semester(s) in which the course is taught	7,8
Person responsible for the course	Assoc. Prof. Nguyen Van Thuan Email: nvthuan@hcmiu.edu.vn Academic members of BT. IU (IU Supervisor) and On-site Supervisor
Language	English
Relation to curriculum	Compulsory
Teaching methods	Projects should be original laboratory, field-based or survey research on a topic proposed by an adviser at IU. Students could also conduct your thesis project outside the University given that your proposal is approved with adequate supervision by an external supervisor.
Workload (incl. contact hours, self-study hours)	(Estimated): The student has four working months for the thesis. Total workload: 960 h (80 h x12 credit) Students are required to meet their advisor weekly to discuss the research progress meeting.

	(Before that, students are also encouraged to participate as volunteers in the labs from year 2 or 3 year to study more techniques and prepare for the thesis)	
Credit points	12 credits (thesis) (34.91 ECTS)	
Required for joining the course	Accumulated at least 113 Credits and have IELTS at least 5.5 or equivalent.	
Course objectives	The thesis aims to develop and demonstrate students' skills in applying theoretical knowledge and using the chosen methods to specify and solve workplace problems. The thesis also demonstrates students' ability to apply their advanced biotechnology knowledge and training in a biotechnological laboratory and work independently in demanding expert duties.	
Course learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	Course learning outcome (CLO)
	Knowledge	CLO1. Be familiar with working in many areas: laboratory sessions, library work, site visits, studio-based sessions, fieldwork, or work-based learning. CLO2. Independently investigate a scientific problem and develop an evolving strategy with the potential to further understanding within the chosen research area. CLO3. Gain the ability to review the literature, which forms the background to the project, and then an element of information gathering through lab work and the use of further literature, assignments, and presentation skills.
	Skill	CLO4. Demonstrate skills in performing experiments, analysis, and presentation of data to support or refute scientific hypotheses. CLO5. Demonstrate employability skills, including safely and competently working in a biotechnology job. CLO6. Communicate their research to others in both written thesis and oral report and engage with relevant research governance.
	Attitude	CLO7. Develop an individual career plan, create a resume, and successfully interview for a job. CLO8. Critically evaluate the findings/creations as unique contributions in the context of previous relevant research.
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>	

	Planned to do the thesis 1. Faculty members will offer a list of possible projects for students' consideration. The proposed projects are closely related to the supervisor's expertise in the IU laboratory system or alternatives elsewhere. Students can select the most interesting project and discuss it with the faculty member proposing it. 2. Students are requested to provide evidence for such an arrangement by completing the thesis registration form (BT01) along with a CV of your supervisor (supervised by a non-IU employer) 3. About eight weeks after starting the research, students must submit a progress report to the school using thesis progress report form BT02. This progress report must be certified by the supervisor. 4. Students have to write the thesis and submit it depending on the date for submission (i.e. four months upon commencement of the research). Two copies of thesis (soft-bounded) should be submitted to the School's secretaries two weeks before the date set for thesis defense. 5. Students present the results thesis to five members of the scientific committee of the department of biotechnology, the reviewer, and their supervisor. 6. After a successful defense, the students revise the thesis according to the comments and amendments required by the Evaluation Committee. The advisor should make sure that all corrections are followed by the student by approving the revised thesis using a report on thesis revision form BT07. 7. Students must submit two copies of the thesis (no binding is required) , a CDROM that contains the electronic versions of the thesis (in both .doc and /pdf formats), and the presentation in PowerPoint. The CDROM should be labeled with the student's name, ID, and graduation year.
Examination forms	Writing thesis and Oral presentation
Study and examination requirements	Students are to send a report to and get advice from his/her Academic Adviser every week. Thesis evaluation: Students must have more than 50/100 points overall to pass the thesis.

2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-8) and Intended Learning Outcomes (ILOs) (1-8) and level of contribution of CLO to ILOs (Low – Medium – High) is shown in the following table:

	ILO							
CLO	1	2	3	4	5	6	7	8
1	M	L		M				
2		M	H					
3			H			H		
4					M	H		
5					H	H		H
6								M
7							H	
8				M				H

3. Course Evaluation:

The thesis will be evaluated by an anonymous reviewer assigned by the School. Students are allowed to present the thesis only if the mark is higher than 50/100. Your supervisor is requested to mark your performance and send the result to the School. The final mark is the average given by five members of the Scientific Committee, the reviewer, and your supervisor.

No. STT	Member of the Committee	Score
1		
2		
3		
4		
5		
6	Thesis advisor	
7	Thesis reviewer	
Total		

Average Score: /100 (Total/No. of members)

4. Date revised: May, 2023

Ho Chi Minh City, 30/05/2023

Dean of School of Biotechnology



Assoc.Prof., Dr. Nguyễn Văn Thuận