

SUBJECT OUTLINE DETAILS

1. Subject: Proteomics Laboratory

- **Code:** BCT406C
- **Credits:** 01
- **Hours:** 30 practice hours

2. Management Unit:

- **Department:** Molecular Biotechnology
- **Faculty/School/Institute/Center/Department:** Biotechnology Research and Development Institute

3. Prerequisites: BT207/BC471C (Biochemistry Lab. 1), BT209/BC472C (Biochemistry Lab. 2).

4. Subject objectives:

4.1. Knowledge:

- 4.1.1. Principles of electrophoresis will be applied to identify isoelectric point (pI) and molecular weight (MW) of protein.

4.2. Skill:

- 4.2.1. Training an isoelectric focusing (IEF) and SDS-PAGE technique.
- 4.2.2. Background for the unit of graduate thesis (BT418).

4.3. Attitude:

- 4.3.1. Self-awareness, laborious, favorite with biochemistry and proteomics.

5. Brief description of subject content:

2D-electrophoresis will be applied to discover pI and MW of protein in Trafish's blood.

6. Subject content structure:

6.1. Practice

	Content	Hours	Objectives
Unit 1. Purification of protein		5	4.1.1, 4.2.1, 4.3.1
	1.1. Extraction of protein		
	1.2. Fraction Precipitation of protein by ammonium sulfate		
	1.3. Dialysing each fractions of protein		
Unit 2. Determining amount of protein		5	4.2.1, 4.2.2, 4.3.1
	2.1. Building a standard curve of protein		
	2.2. Testing amount of protein in each fraction		
Unit 3. Analyzing pI of protein by IEF		5	4.2.1, 4.2.2, 4.3.1
	3.1. Preparation of protein samples for IEF		
	3.2. Starting a progress of IEF		
Unit 4. Determining MW of protein		10	4.2.1, 4.2.2,

4.1. Preparation of sample and electrophoresis gel		4.3.1
4.2. Starting a process of electrophoresis by SDS-PAGE		
Unit 5. Analyzing pI and MW of protein	5	4.2.1, 4.2.2, 4.3.1
5.1. Taking a electrophoresis gel by GelDoc system		4.3.1
5.2. Analyzing pI and MW of protein by PDQuest		

7. Teaching method:

- Presentation about conducting and steps of an experiment.
- Question – Answer (oral) to make clear steps in each unit.

8. Duties of student:

Students have to do the following duties:

- Following full (100%) time for a practical course at a lab. and reporting results of the experiment.
- Attending a final examination.

9. Assessment of student learning outcomes:

9.1. Assessment

No.	Point components	Rules and Requirement	Weights	Objectives
1.	Laborious mark	Lab. hours/total hours of a course	10%	4.3
2.	Mark of a writing report	Writing a report about result of each unit (group: 3-4 students)	40%	4.1.2., 4.2.1., 4.2.2., 4.2.3., 4.3
3.	Mark of a final examination	- Multiple choice - Obligatory	50%	4.2.2., 4.2.3

9.2. Grading

- Grading components and final test scores will be marked on a scale of 10 (0 to 10), rounded to one decimal place.
- Subject score is the sum of all the components of the evaluation multiplied by the corresponding weight. The subject score is marked on a scale of 10 and rounded to one decimal place, then is converted to A-B-C-D score and score on a scale of 4 under the academic provisions of the University.

10. Materials:

	Materials information	Code number
[1]	Dương Thị Hương Giang và Võ Văn Song Toàn. <i>Thực hành protein/enzyme học</i> . Tài liệu lưu hành nội bộ.	Enzyme Technology lab.
[2]	Janson, Jan-Christer and Lars Ryden. 1998. Protein purification: Principles, High Resolution Methods, and Application 2 nd . John Wiley & Sons. Canada.	Enzyme Technology lab.
[3]	Scopes R. K., 1994. Protein Purification: Principles and Practice, 3 rd . Springer-Verlag. New York.	Enzyme Technology lab.
[4]	Hames, B. D. 1998. Gel Electrophoresis of protein: A practical approach, 3 rd . Oxford University Press. USA.	Enzyme Technology lab.
[5]	Westermeier, R., Sonja Gronau, Phil Beckett, Tom	Enzyme

Berkelman, Josef Bulles, Hanspeter Schickle, Gunter
Theßeling. 2001. Electrophoresis in Practice. *Wiley-VCH
Verlag*. Federal Republic of Germany

Technology lab.

[6] Donal H. Whitmore. 1990. Electrophoretic and Isoelectric
Focusing Techniques in Fisheries management. *CRC Press*.
USA

Enzyme
Technology lab.

11. Self-study Guide:

	Content	Theory (hours)	Practice (hours)	Students' duties
1	Unit 1: Purification of protein 1.1. Extraction of protein 1.2. Fraction Precipitation of protein by ammonium sulfate 1.3. Dialysing each fractions of protein	0	5	- Group working (following a list of students) with the unit 1 (<i>from p1 to p2</i>) guided in the reference [1,2,3] - Writing the report - Self-studying methods and steps of an experiment in the unit 2.
2	Unit 2: Determining amount of protein 2.1. Building a standard curve of protein 2.2. Testing amount of protein in solution	0	5	- Group working (following a list of students) with the unit 2 (<i>from p3 to p5</i>) guided in the reference [1,2,3]. - Writing the report - Self-studying methods and steps of an experiment in the unit 3.
3	Unit 3: Analyzing pI of protein by IEF 3.1. Preparation of protein samples for IEF 3.2. Starting a progress of IEF	0	5	- Group working (following a list of students) with the unit 3 (<i>from p6 to p9</i>) guided in the reference [1,5,6]. - Writing the report - Self-studying methods and steps of an experiment in the unit 4.
4	Unit 4: Determining MW of protein 4.1. Preparation of sample and electrophoresis gel 4.2. Starting a process of electrophoresis by SDS-PAGE	0	10	- Group working (following a list of students) with the unit 3 (<i>from p10 to p12</i>) guided in the reference [1,4]. - Writing the report - Self-studying methods and steps of an experiment in the unit 4.
5	Unit 5: Analyzing pI and MW of protein by PD-Quest Analyzing molecular weight of protein by SDS-PAGE	0	5	- Group working (following a list of students) with the unit 4 (<i>from p13 to p16</i>) guided in the reference [1,3] - Writing the report - Taking the final examination after the last unit about 7-15 days.

Can Tho, 28 / 5 /2014

**ON BEHALF OF RECTOR
DEAN/ DIRECTOR**

HEAD OF DEPARTMENT