

## SUBJECT OUTLINE DETAILS

### 1. Subject: Food Biochemistry Lab. (TT. Hóa sinh thực phẩm)

- Code: CS345C

- Credits: 1

- Hours: 30 practical hours, 30 self-study hours

### 2. Management Unit:

- Department of Molecular Biotechnology

- Biotechnology Research and Development Institute

3. Prerequisites: Biochemistry I & II (BC461C & BC462C), food biochemistry (CS344C).

### 4. Subject objectives:

After finishing the course in food biochemistry laboratory, the students will achieve the expected learning outcomes:

#### 4.1. Knowledge:

After completing this course, the students were expected to gain knowledge about:

4.1.1. The practical knowledge in food biochemistry of water activity, solubility, viscosity, protein, enzymes and pigments.

4.1.2. Effects of factors such as temperature, pH and chemicals on food ingredients and biochemical changes in food processing.

4.1.3. Models of biochemistry processes in food processing.

#### 4.2. Skills:

4.2.1. Students will be trained to get advanced knowledges, practical skills, professional skills, teamwork skills, data analysis and scientific report in food biochemical industry.

4.2.2. Students can design, implement, analyze and evaluate experiments.

4.2.3. Using simple and modern equipments.

#### 4.3. Attitude:

4.3.1. Students should have the good attitudes in laboratories and pilot plants.

4.3.2. Students should understand the important role of safety in food.

4.3.3. Students should be developed attitudes relevant to the application of food biochemical knowledge in practical.

4.3.4. Students must have a positive sense in their self-learning.

### 5. Brief description of subject content:

This course provides the practical knowledge in food biochemistry. The students will practise to understand about water activity, solubility, viscosity, coagulation of protein and color reaction of hemoglobin. The effects of factors on the changes of biochemical materials will be examined. The model of biochemical processes in food processing such as beer production will also be carried out.

### 6. Subject content structure:

	<b>Content</b>	<b>Hours</b>	<b>Objectives</b>
<b>Experiment 1.</b>	Water activity.	4	4.1.1, 4.2, 4.3
<b>Experiment 2.</b>	Solubility, viscosity, coagulation of protein.	4	4.1.1, 4.2, 4.3
<b>Experiment 3.</b>	Color reaction of hemoglobin.	5	4.1.1, 4.2, 4.3
<b>Experiment 4.</b>	Effects of heat and pH on Biochemical changes of pigments: Chlorophyll (Apple) and Anthocyanins (Grape).	4	4.1.2, 4.2, 4.3
<b>Experiment 5.</b>	Enzymatic browning of fruits.	4	4.1.1, 4.2, 4.3
<b>Experiment 6.</b>	Starch gels and viscosity curves of starch pastes.	4	4.1.1, 4.2, 4.3
<b>Experiment 7.</b>	Beer production.	5	4.1.3, 4.2, 4.3

### 7. Teaching method:

- Teaching theories and practicals in laboratory
- Group and individual practicals
- Group discussion
- Tests/ reports

### 8. Duties of student:

Students have to do the following duties:

- Attending 100 % hours in laboratory
- Participate in group and individual assignments
- Doing the tests/ reports
- Proactively implementing self-study
- On duty

### 9. Assessment of student learning outcomes:

#### 9.1. Assessment

<b>No.</b>	<b>Point components</b>	<b>Rules and Requirement</b>	<b>Weights</b>	<b>Objectives</b>
1	Overall attendance	- 100 % hours in laboratory	Requirement	4.3
2	Group/individual assignments	- Carry out the experiments	20%	4.1, 4.2, 4.3
	Group reports	- Writing the group report for every experiment	35%	4.1, 4.2
3	Tests	- Taking the quick tests	45%	4.1, 4.2

#### 9.2. Grading

- Grading components, reports and 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-F score and score on a scale of 4 under the academic provisions of Cantho University.

## 10. Materials:

Materials information	Code number
[1] Hand-out	Students are received hand-out in class
[2] Ballantine Books. 1977. The World guide to beer. New York : Ballantine Books.	641.2/ W927
[3] Connie M. Weaver, James R. Daniel. 2003. The Food chemistry laboratory: A manual for experimental Foods, dietetics, and Food scientists. New York : CRC Press.	664.07/ W363
[4] Joseph Alphonse Laker. 1975. Entrepreneurship and the development of the Japanese beer industry 1872-1937. U.S.A.: Indiana University.	338.4/ L192
[5] Lincoln M. Lampert. 1975. Modern dairy products: composition, Food value, processing, chemistry, bacteriology, testing, imitation dairy products. New York : Chemical Pub. Co.	637.1/ L237
[6] Ronald E. Wrolstad ... [et al.]. 2005. Handbook of Food analytical chemistry. New Jersey: John Wiley and Sons, Inc.	664.07/ H236
[7] Ronald E. Wrolstad ... [et al.]. 2005. Handbook of Food analytical chemistry: Pigments, colorants, flavors, textures, and bioactive Food components. Hoboken, N.J. : J. Wiley.	664.07/ H236/Pig
[8] Ronald E. Wrolstad ... [et al.]. 2005. Handbook of Food analytical chemistry: Water, proteins, enzymes, lipids, and carbohydrates. Hoboken, N.J. : J. Wiley.	664.07/ H236/Wat
[9] Srinivasan Damodaran, Kirk L. Parkin, Owen R. Fennema. 2008. Fennema's Food chemistry. CRC Press/Taylor & Francis,	664/ D163

## 11. Self-study Guide:

Week	Content	Theory (hours)	Practice (hours)	Students' duties
1	<b>Experiment 1.</b> Water activity.	0	4	- Previous research and reference: +References/materials: Experiment 1, [1], [6], [8] - Group and individual practicals - Group discussion - Group reports
2	<b>Experiment 2.</b> Solubility, viscosity, coagulation of protein.	0	4	Previous research and reference: +References/materials: Experiment 2, [1], [3], [6] - Group and individual practicals - Group discussion - Group reports
3	<b>Experiment 3.</b> Color reaction of hemoglobin.	0	5	Previous research and reference: +References/materials: Experiment 3, [1], [3], [8] - Group and individual practicals - Group discussion

				- Group reports - Tests
<b>4</b>	<b>Experiment 4.</b> Effects of heat and pH on Biochemical changes of pigments: Chlorophyll (Apple) and Anthocyanins (Grape).	0	4	Previous research and reference: +References/materials: Experiment 4, [1], [6], [7] - Group and individual practicals - Group discussion - Group reports
<b>5</b>	<b>Experiment 5.</b> Enzymatic browning of fruits.	0	4	Previous research and reference: +References/materials: Experiment 5, [1], [5], [8] - Group and individual practicals - Group discussion - Group reports - Tests
<b>6</b>	<b>Experiment 6.</b> Starch gels and viscosity curves of starch pastes.	0	4	Previous research and reference: +References/materials: Experiment 6, [1], [3], [8] - Group and individual practicals - Group discussion - Group reports
<b>7</b>	<b>Experiment 7.</b> Beer production.	0	5	Previous research and reference: +References/materials: Experiment 7, [1], [2], [4], [9] - Group and individual practicals - Group discussion - Group reports - Tests

**ON BEHALF OF RECTOR  
DEAN/ DIRECTOR**

Can Tho, ...../...../20...  
**HEAD OF DEPARTMENT**