

## SUBJECT OUTLINE DETAILS

### 1. Subject: BIOTECHNOLOGY SEMINAR IV

- Code: BT298C
- Credits: 02
- Hours: 30 theory hours, and 60 self-study hours.

### 2. Management Unit:

- Department of Microbial Biotechnology
- Biotechnology Research and Development Institute.

### 3. Prerequisites: none

### 4. Subject objectives:

#### 4.1. Knowledge:

Students will develop knowledge and understanding of:

4.1.1. the mechanism of activities of microorganisms in microbiology, environment and biotechnology.

4.1.2. knowledge of mechanism of plant-microbe interaction, microbiology in food fermentation, microorganisms in environmental pollution, waste treatment.

#### 4.2. Skill: students will be able to

4.2.1. increase knowledge about the mechanisms of activities of microorganisms in various fields of microbiology, environment, biotechnology.

4.2.2. apply knowledge in problem-solving skills.

4.2.3. exchange and share biotechnology knowledge in various aspects.

4.2.4. work individually and in groups by updating knowledge through books, journals or internet.

#### 4.3. Attitude:

4.3.1. Actively participate in class seminar activities and in working in teams

4.3.2. Students are encouraged to develop positive values and informed critical attitudes.

4.3.3. Develop a sense of independent learning and an inquiry mind for self-study.

**4.4 Brief description of subject content:** This course will acquaint students with the mechanisms of the interactions between microbes and plants, foods, environments. Topics include the Plant and Soil, Microbial biotechnology; Medicinal Microbiology, Food biotechnology, and Environment biotechnology.

#### 4.5 Subject content structure:

Contents	Hours	Objectives
<b>PART I. MECHANISMS OF THE INTERACTIONS BETWEEN PLANTS-MICROBES</b>	<b>10</b>	4.1.1; 4.1.2; 4.2.1; 4.2.2; 4.2.3; 4.2.4; 4.3;
<b>1. Topic 1: Mechanisms of nitrogen fixing bacteria and their host</b> - Introduction (by Lecturer) - Seminar (by Students)	<b>0.5</b> <b>4.5</b>	
<b>2. Topic 2: Mechanisms of phosphate solubilizing bacteria in soils</b> - Introduction (by Lecturer) - Seminar (by Students)	<b>0.5</b> <b>2.5</b>	
<b>3. Topic 3: Mechanisms of bacterial endophytes and their phytohormones biosynthesis activity</b> - Introduction (by Lecturer) - Seminar (by Students)	<b>0.5</b> <b>1.5</b>	
<b>PART II. MECHANISMS OF BENEFICIAL MICROBES AND MEDICINAL PLANTS</b>	<b>10</b>	4.1.1; 4.1.2; 4.2.1; 4.2.2; 4.2.3; 4.2.4; 4.3;
<b>4. Topic 4: Mechanisms of bacterial endophytes and their antibacterial activity</b> - Introduction (by Lecturer) - Seminar (by Students)	<b>1.0</b> <b>4.0</b>	
<b>5. Topic 5: Mechanisms of fungal endophytes and their antimicrobial activity</b> - Introduction (by Lecturer) - Seminar (by Students)	<b>1.0</b> <b>4.0</b>	
<b>PART III. MECHANISMS OF MICROORGANISMS IN TREATING OF ENVIRONMENTAL POLLUTION</b>	<b>7</b>	4.1.1; 4.1.2; 4.2.1; 4.2.2; 4.2.3; 4.2.4; 4.3;
<b>6. Topic 6: Mechanisms of cellulose degrading bacteria</b> - Introduction (by Lecturer) - Seminar (by Students)	<b>0.5</b> <b>2.0</b>	
<b>7. Topic 7: Mechanisms of proteolytic degrading bacteria -</b> Introduction (by Lecturer) - Seminar (by Students)	<b>0.5</b> <b>2.0</b>	

<b>8. Topic 8: Mechanisms of starch degrading bacteria -</b> Introduction (by Lecturer) - Seminar (by Students)	<b>0.5</b> <b>1.5</b>	
<b>PART IV. FOOD MICROORGANISMS</b>	<b>3</b>	
<b>9. Topic 9: Mechanisms of various microorganisms in food fermentation</b> - Introduction (by Lecturer) - Seminar (by Students)	<b>1</b> <b>2</b>	

### 7. Teaching methods:

- Introducing and explaining.
- Providing articles, media resources, websites...
- Encourage students self- learning and - searching knowlegde for seminars

### 8. Duties of student:

- Lecture/Class attendance: not allow to absent more than 20% of lectures.
- Seminar attendance: mandatory.
- Discussion and homeworks: mandatory

### 9. Assessment of student learning outcomes:

#### 9.1. Assessment

No.	Point components	Rules and Requirement	Weights
2	Midterm exam/ Seminars	Tests/ Oral presentation	30%
3	Final exam	Tests/ Oral presentation	70%

#### 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] William B. T. 2005 Waste treatment and Disposal. John Wiley and Sons. LTD. England.	Viện NC và PT công nghệ SH
[2] Dilworth M J, Jame E K., Sprent J.I. and Newton W E. 2008 Nitrogen fixing leguminous symbiosis. Springer. The Netherlands.	Viện NC và PT công nghệ SH
[3] Biotechnology in the food industry / M P Tombs.- 1st.- Milton Keynes: Open Univ, 1990, 189p., 0 471 93276 0.- 644/ T656	Viện NC và PT công nghệ SH
[4] Madigan M T, J M Martinco, D Stahl and D Clark 2012 Brock Biology of	Viện NC và PT công

**11. Self-study Guide:**

Week	Content	Theory (hours)	Students' duties
	<b>PART I. MECHANISMS OF THE INTERACTIONS BETWEEN PLANTS-MICROBES</b>	<b>10</b>	<b>Based on each Topic:</b>
1	<b>1. Topic 1: Mechanisms of nitrogen fixing bacteria and their host</b> - Introduction (by Lecturer) - Seminar (by Students)	5	- Reading: [2], [4] - Finding and accessing: contents/ theory from the internet, books, handouts, lectures... preparing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
2	<b>2. Topic 2: Mechanisms of phosphate solubilizing bacteria in soils</b> - Introduction (by Lecturer) - Seminar (by Students)	3	-Reading: [4] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... preparing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
3	<b>3. Topic 3: Mechanisms of bacterial endophytes and their phytohormones biosynthesis activity</b> - Introduction (by Lecturer) - Seminar (by Students)	2	-Reading:[4] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... preparing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
	<b>PART II. MECHANISMS OF BENEFICIAL MICROBES AND MEDICINAL PLANTS</b>	10	
4	<b>4. Topic 4: Mechanisms of bacterial endophytes and their antibacterial activity</b> - Introduction (by Lecturer) - Seminar (by Students)	5	-Reading: [4],[5] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... preparing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
5	<b>5. Topic 5: Mechanisms of fungal endophytes and their antimicrobial activity</b>	5	-Reading: [4],[5] -Finding and accessing: contents/ theory from the

	- Introduction (by Lecturer) - Seminar (by Students)		internet, books, handouts, lectures... preparing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
6	<b>PART III. MECHANISMS OF MICROORGANISMS IN TREATING OF ENVIRONMENTAL POLLUTION</b>	<b>7</b>	<b>Based on each Topic:</b>
	<b>6. Topic 6: Mechanisms of cellulose degrading bacteria</b> - Introduction (by Lecturer) - Seminar (by Students)	2.5	-Reading: [1], [4] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... preparing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
7	<b>7. Topic 7: Mechanisms of proteolytic degrading bacteria -</b> Introduction (by Lecturer) - Seminar (by Students)	2.5	-Reading: [1], [4] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... preparing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
	<b>8. Topic 8: Mechanisms of starch degrading bacteria -</b> Introduction (by Lecturer) - Seminar (by Students)	2	-Reading: [1], [4] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... preparing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
9	<b>PART IV. FOOD MICROORGANISMS</b>	<b>3</b>	
	<b>9. Topic 9: Mechanisms of various microorganisms in food fermentation</b> - Introduction (by Lecturer) - Seminar (by Students)	3	-Reading: [3], [4] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... preparing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
	Total	<b>30</b>	
<b>10</b>			<b>Taking the Final exam</b>

ON BEHALF OF RECTOR  
DEAN/ DIRECTOR

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

*Note: For Department of Biology which belongs directly to the university, the signature is the following*

Can Tho, ...../...../20...

**ON BEHALF OF RECTOR  
HEAD OF DEPARTMENT**