MINISTRY OF EDUCATION AND TRAINING
CAN THO UNIVERSITY

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

SUBJECT OUTLINE DETAILS

1. Subject: BIOTECHNOLOGY SEMINAR III

- **Code:** BT197C
- **Credits:** 01
- **Hours:** 15 theory hours, and 30 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 importance of biotechnology including microbiology, molecular biology, biochemistry.

4.1.2. basic knowledge of plant-microbe interaction, microbiology on food fermentation, microorganisms in environmental pollution, microbial enzymes used in food processing, waste treatment.

4.2. Skill: students will be able to

4.2.1. increase knowledge about important role of microorganisms in various fields of 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 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
PART I. INTERACTIONS BETWEEN PLANTS-MICROBES	**4**	4.1.1; 4.1.2; 4.2.1; 4.2.2; 4.2.3; 4.2.4; 4.3;
1. Topic 1: Symbiosis of legume crops - Introduction (by Lecturer) - Seminar (by Students)	**0.5** **1.5**	
2. Topic 2: Symbiosis of non-legume crops - Introduction (by Lecturer) - Seminar (by Students)	**0.5** **1.5**	
PART II. INTERACTIONS BETWEEN MEDICINAL PLANTS-MICROBES	**4**	4.1.1; 4.1.2; 4.2.1; 4.2.2; 4.2.3; 4.2.4; 4.3;
3. Topic 3: Antibacterial endophytes in medicinal plants - Introduction (by Lecturer) - Seminar (by Students)	**0.5** **1.5**	
4.Topic 4: Isolation and characterization of endophytes in mecidicinal plants. - Introduction (by Lecturer) - Seminar (by Students)	**0.5** **1.5**	
PART III. ENVIRONMENTAL MICROORGANISMS	**4**	4.1.1; 4.1.2; 4.2.1; 4.2.2; 4.2.3; 4.2.4; 4.3;
5. Topic 5: Application of microalgae in treating waste water - Introduction (by Lecturer) - Seminar (by Students)	**0.5** **1.5**	
6. Topic 6: Application of microorganisms in treating of organic waste - Introduction (by Lecturer) - Seminar (by Students)	**0.5** **1.5**	
PART IV. FOOD MICROORGANISMS	**3**	

7. Topic 7: Beneficial microorganisms in Food biotechnology - Introduction (by Lecturer) - Seminar (by Students)	**1** **2**	

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] Mara and Horan 2003 The Handbook of Water and Wastewater Microbiology	Viện NC và PT công nghệ SH
[2] Food biotechnology / Roger Angold, Gordon Beech, John Taggart.- Cambridge: Cambridge University Press, 1989.- 171 p., 24 cm (Cambridge Studies in Biotechnology 7), 0521266319.- 664.024/ A592	CN.001830
[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 microorganisms. Prentice Hall International, Inc. Tái bản lần thứ 11. USA.	Viện NC và PT công nghệ SH
[5] WHO. 1990 Medicinal plants in Vietnam. Manilla, The Philippines. pp.220	Viện NC và PT công nghệ SH

11. Self-study Guide:

Week	Content	Theory (hours)	Students' duties
1 2	**PART I. INTERACTIONS BETWEEN PLANTS-MICROBES**	4	***Based on each Topic:***
	1. Topic 1: Symbiosis of legume crops - Introduction (by Lecturer) - Seminar (by Students)	2	- Reading: [4] - Finding and accessing: contents/ theory from the internet, books, handouts, lectures... prepairing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
	2. Topic 2: Symbiosis of non-legume crops - Introduction (by Lecturer) - Seminar (by Students)	2	-Reading: [4] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... prepairing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
3 4	**PART II. INTERACTIONS BETWEEN MEDICINAL PLANTS-MICROBES**	4	***Based on each Topic:***
	3. Topic 3: Antibacterial endophytes in medicinal plants - Introduction (by Lecturer) - Seminar (by Students)	2	-Reading:[4],[5] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... prepairing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
	4.Topic 4: Isolation and characterization of endophytes in mecidicinal plants. - Introduction (by Lecturer) - Seminar (by Students)	2	-Reading: [4],[5] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... prepairing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
5	**PART III. ENVIRONMENTAL MICROORGANISMS**	4	***Based on each Topic:***
	5. Topic 5: Application of microalgae in treating wastewater - Introduction (by Lecturer) - Seminar (by Students)	2	-Reading: [1], [4] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... prepairing PPT and

			carrying out the seminar (in group), discuss and answer the questions from other groups.
6	**6. Topic 6: Application of microorganisms in treating of organic waste** - Introduction (by Lecturer) - Seminar (by Students)	2	-Reading: [1], [4] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... prepairing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
	PART IV. FOOD MICROORGANISMS	3	
7	**7. Topic 7: Beneficial microorganisms in Food biotechnology** - Introduction (by Lecturer) - Seminar (by Students)	3	-Reading: [2], [3] -Finding and accessing: contents/ theory from the internet, books, handouts, lectures... prepairing PPT and carrying out the seminar (in group), discuss and answer the questions from other groups.
	Total	**15**	
10			**Taking the Final exam**

Can Tho, ……./……../20…

ON BEHALF OF RECTOR
DEAN/ DIRECTOR

HEAD OF DEPARTMENT