

COURSE OUTLINE DETAILS

1. Course: Principles of ecology (Sinh thái học đại cương)

- **Code number:** AQ210

- **Credits:** 2

- **Hours:** 30 theory hours, 60 self-study hours

2. Management Unit:

- **Department:** Applied Hydrobiology

- **Faculty:** College of Aquaculture and Fisheries

3. Requisites:

- **Prerequisites:** No

- **Corequisites:** No

4. Course objectives:

Objectives	Descriptions	Program Outcomes
4.1	To provide students strong background on aquatic ecology with ecological processes, population and community dynamics, biodiversity and human impacts to help students synthesize crucial knowledge to apply in aquaculture activities in the Mekong Delta.	2.1.2.a
4.2	To train students ability to determine ecological factors and their effects on aquatic organisms in order to evaluate and analyze the status of a population or community for applying in aquaculture production practice in the Mekong Delta and protection of aquatic ecosystems.	2.2.1.a
4.3	To develop critical thinking, presentation, communication skills and confidence for students	2.2.2
4.4	To raise student's awareness on self-study and long life study attitude	2.3

5. Course learning outcomes:

COs	Descriptions	Objectives	POs
	Knowledge		
CO1	Characterize environmental factors and their effects on communities regarding to individual and population development in aquatic ecosystems.	4.1	2.1.2.a
CO2	Explain effects of internal, external factors and human impacts on distribution and life of organisms in the aquatic ecosystems.	4.1	2.1.2.a
	Skills		

COs	Descriptions	Objectives	POs
	Knowledge		
CO3	Analyze and apply the matter metabolism cycle in water bodies to aquaculture systems to improve the productivity of aquaculture systems.	4.2	2.2.1.a
CO4	Analyze and evaluate individual and population biological characteristics of aquatic organisms in relation to the fluctuations of environmental factors and their application in planning aquaculture practice.	4.2	2.2.1.a
CO5	Develop discussion, teamwork skills and lifelong learning capabilities.	4.3	2.2.2
	Attitudes/Autonomy/Responsibilities		
CO6	Display self-responsibility and be proactive in study and research.	4.4	2.3

6. Brief description of the course:

The course will provide students knowledge on ecological processes, the ecological components and their interactions; individual and population growth of organisms and adaptation of organisms in the ecosystem; application of ecological conditions in aquaculture development in the Mekong Delta.

7. Course structure:

	Content	Hours	COs
Chapter 1.	Introduction to aquatic ecology	3	CO1, CO2
1.1.	Terms and definitions on aquatic ecology		
1.2.	Biotic structure of ecosystems		
1.3.	Diversity assessment method		
1.4.	Ecological laws		
Chapter 2.	Ecological factors and their effects on aquatic organisms	3	
2.1.	Physical characteristics		CO1, CO2, CO3, CO4, CO5
2.2.	Chemical characteristics		
Chapter 3.	Living organisms in the aquatic environment	3	
3.1.	Groups of aquatic organisms (plankton, nekton, benthos...)		CO1, CO2, CO3, CO4, CO5
3.2.	Movement mechanisms		
3.3.	Feeding mechanisms		
3.4.	Growth and development		
3.5.	Water and ion exchange mechanisms		
3.6.	Gas exchange mechanisms		
Chapter 4.	Population ecology	3	CO1, CO2, CO3, CO4, CO5
4.1.	Population structure		
4.2.	Population growth		

4.3.	Population dynamics		
4.4.	Migration and reproduction		
Chapter 5.	Community organization	3	CO1, CO2, CO3, CO4, CO5
5.1.	Community structure		
5.2.	Distribution characteristics		
5.3.	Distribution in specific aquatic ecosystems		
5.4.	Competition, coexistence and succession		
Chapter 6.	Habitat types peculiar to aquatic systems	3	CO1, CO2, CO3, CO4, CO5
6.1.	Common habitats/ecosystems		
6.2.	Natural conditions of the Mekong Delta		
6.3.	Aquaculture and natural habitats		
Chapter 7.	Biodiversity and human impacts		CO1, CO2, CO3, CO4, CO5
7.1.	Importance of biodiversity		
7.2.	Human impacts		
7.3.	Climate changes impacts		
7.4.	Measures for protection of biodiversity and ecosystem		

8. Teaching methods:

- Class lectures
- Students will be assigned with different topics on aquatic ecology for group working, presentation and discussion on class

9. Duties of student:

Students have to do the following duties:

- Attending at least 80% of theoretical session
- Attending 100% hours of practical and reporting results
- Participating in group discussions and presentation
- Taking quizzes
- Taking final test

10. Assessment of course learning outcomes:

10.1. Assessment

No.	Point components	Rules and Requirement	Weights	COs
1	Attendance	Number of attendance hour/total class hours	5%	CO6
2	Work assignment	Seminar/presentation Participation confirmed by team	20%	CO5, CO6
	Mid term exam	Multiple choice exam Not absent	15%	CO1, CO2, CO3, CO4

	Final exam	Multiple choice combined with written exam Attending at least 80% theoretical hours and 100% practical hour of lab work Compulsory exam	60%	CO1, CO2, CO3, CO4, CO5, CO6
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10.2. Grading

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

11. Learning materials:

Learning materials information	Barcode number
[1] Barnes, R.S.K. and Mann, K.H. 1991. Fundamentals of aquatic ecology. Blackwell Science Ltd. 270pp	TS. 002117
[2] Molles, M.C. 2008. Ecology: Concepts and Applications. Fourth edition. Mc Graw Hill Higher Education, 604 pp.	TS 005101
[3] Nybakken, J.W. 2001. Marine biology. An Imprint of Addison Wesley Longman, Inc. 516 pp.	MOL 058675

12. Self-study Guide:

Week	Content	Theory (hours)	Practice (hours)	Students' duties
1	Chapter 1: Introduction on aquatic ecology 1.1. Terms and definitions on aquatic ecology 1.2. Biotic structure of ecosystems 1.3. Diversity assessment method 1.4. Ecological laws	3		Students should read in advance: + Reference [1] pp 3-4; + Reference [2] pp. 2-4 + Reference [3] pp 15-18
2&3	Chapter 2: Ecological factors and their effects on aquatic organisms 2.1. Physical characteristics 2.2. Chemical characteristics 2.3. Differences between aquatic and			Students should read in advance: + Reference [1] pp. 21-26; 91-100 + Reference [3] pp. 1-7; 28-32; 59-69

	terrestrial environments			
4&5	Chapter 3: Living organisms in the aquatic environment 3.1. Groups of aquatic organisms (plankton, nekton, benthos...) 3.2. Movement mechanisms 3.3. Feeding mechanisms 3.4. Growth and development 3.5. Water and ion exchange mechanisms 3.6. Gas exchange mechanisms			Students should read in advance: + Reference [1] pp. 4-13; 186-206 + Reference [3] pp. 98-122
6&7	Chapter 4: Population ecology 4.1. Population structure 4.2. Population growth 4.3. Population dynamics 4.4. Migration and reproduction			Students should read in advance: + Reference [1] pp. 14-24; 145-169 + Reference [2] pp. 210-271
8	Chapter 5: Community organization 5.1. Community structure 5.2. Distribution characteristics 5.3. Distribution in specific aquatic ecosystems 5.4. Competition, coexistence and succession			Students should read in advance: + Reference [1] pp. 29-55 + Reference [2] pp. 298-302
9,10 &11	Chapter 6: Habitat types peculiar to aquatic systems 6.1. Common habitats/ecosystems 6.2. Natural conditions of the Mekong Delta			Students should read in advance: + Reference [1] pp. 125-142 ; 213-227; [2] pp 15-45;

	6.3. Aquaculture and natural habitats			
12&13	Chapter 7: Biodiversity and human impacts 7.1. Importance of biodiversity 7.2. Human impacts 7.3. Climate changes impacts 7.4. Measures for protection of biodiversity and ecosystem			Students should read in advance: + Reference [1] pp. 245-264

ON BEHALF OF RECTOR
DEAN OF COLLEGE



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HEAD OF DEPARTMENT

Huỳnh Trường Giang