

COURSE OUTLINE DETAILS

1. Course: Fish and Shellfish Diseases (Bệnh Thủy sản)

- **Code number:** AQ306C
- **Credits:** 3
- **Hours:** 30 theory hours, 30 practice hours, and 60 self-study hours

2. Management Unit:

- **Department:** Aquatic Pathology
- **Faculty:** College of Aquaculture and Fisheries

3. Requisites:

- **Prerequisites:** No
- **Corequisites:** No

4. Course objectives:

| Objectives | Descriptions | Program Outcomes |
|------------|---|------------------|
| 4.1 | Provides basic concepts of aquatic animal diseases, including descriptions of diseases, etiological agents, geographical distributions, species susceptibility, clinical signs, epidemiology, diagnostics, and treatment/prevention of infectious/non-infectious diseases in aquatic animals. | 2.1.2a 2.1.3b |
| 4.2 | Students will be trained with laboratory diagnosis abilities for aquatic animal diseases. | 2.2.1a |
| 4.3 | Develop active and innovative teamwork abilities. | 2.2.2 |
| 4.4 | Strengthen habits of responsibility for health management in aquatic animals, protect the stable and friendly environment, and welfare aspects of aquatic veterinary medicine. Promote responsible aquatic animal health management practices, sustainable environmental protection, and welfare aspects of aquatic animal health. | 2.3 |

5. Course learning outcomes:

| COs | Descriptions | Objectives | POs |
|-----|---|------------|--------|
| | Knowledge | | |
| CO1 | Recognize the fundamental concepts of aquatic animal pathology and comprehend the connections between the host, environment, and pathogens. | 4.1 | 2.1.2a |
| CO2 | Implement conventional diagnostic procedures in fish and shrimp for bacterial, viral, fungal, and parasitic diseases. | 4.1 | 2.1.3b |
| CO3 | Understand the aetiological agents, geographical distributions, species susceptibility, clinical signs, epidemiology, diagnostics, and treatment/prevention of infectious/non-infectious diseases in aquatic animals. | 4.1 | 2.1.3b |
| | Skills | | |
| CO4 | Practice laboratory diagnostic techniques for aquatic animal diseases, such as identification of microbial and parasitic infections in fish and detection of viral pathogens in shrimp. | 4.2 | 2.2.1a |
| | Attitudes/Autonomy/Responsibilities | | |
| CO5 | Understand the responsibilities of aquatic veterinary management, sustainable environmental protection, and the welfare aspects of aquatic veterinary medicine. | 4.4 | 2.3 |

Note: "COs" means Course Outcomes; "POs" means Program Outcomes

6. Brief description of the course:

The course will provide the fundamental principles of aquatic animal pathology and the connection between the host, environment, and pathogens. The lectures will cover disease descriptions, etiological agents, geographical distribution, species susceptibility, clinical symptoms, clinical pathology, epidemiology, infectious disease prevention and management, and parasites of fish/shrimp diseases. Furthermore, students will be introduced to the laboratory activities to practice the diagnostic techniques for identifying microbial fish pathogens and parasites including identification, life cycles, and treatment methods of fish/shrimp diseases.

7. Course structure:

7.1. Theory:

| | Content | Hours | COs |
|--|---------|-------|-----|
|--|---------|-------|-----|

| | | | |
|-------------------|---|-----------|---|
| Chapter 1. | General introduction disease in aquaculture and concepts of aquatic animal health management. | 2 | CO1, CO2, CO3, CO5 Dr.TTDung |
| 1.1. | General introduction to aquatic diseases in the world and Vietnam. | 1 | |
| 1.2. | Basic principles of aquatic animal pathology and understanding host, environment, and pathogen interactions. | 1 | |
| Chapter 2. | Fish diseases | 14 | CO1, CO2, CO3, CO5 Dr.TTDung |
| 2.1. | Introduction of some common viral diseases in farmed fish | 2 | |
| 2.2. | Introduction of some common bacterial diseases in farmed fish | 3 | |
| 2.3. | Introduction diagnostic techniques, control and management for specific infectious diseases on fungal infection (lower and higher fungi). | 2 | Dr. PMDuc |
| 2.4. | Introduction diagnostic techniques, control and management for specific infectious diseases on Marine/tropical fish: Parasitic diseases | 3 | Dr.TTDung |
| 2.5. | Introduction diagnostic techniques, control and management for crustacean and other fish diseases. | 1 | Dr.TTDung |
| 2.6. | Introduction topic presentations Student topic presentations and discussion. Short examination | 3 | Dr.TTDung |
| Chapter 3. | Shrimp diseases | 14 | CO1, CO2, CO3, CO5 Dr. TTTHoa |
| 3.1. | Introduction to some common viral diseases in cultured shrimp | 4 | |
| 3.2. | Introduction diagnostic techniques, control and management for specific infectious diseases on shrimp: fungal and parasitic diseases. Introduction to some common diseases in cultured shrimp: bacterial, fungal and parasitic diseases. | 4 | |

| | | | |
|------|---|---|--|
| 3.3. | Introduction to non-infectious diseases in shrimp. Some common diagnostic techniques, and control methods of shrimp diseases. Introduction topic presentations Short examination | 3 | |
| 3.4. | Student topic presentations and discussions | 3 | |

7.2. Practice:

| | Content | Hours | COs |
|----------------|--|-------|---------------------------|
| Unit 1. | Practice in the Lab: Diagnosis in fish diseases | 15 | CO1, CO2, CO3, CO5 |
| 1.1. | Introduction to Laboratory procedures Parasites examine methods | 4 | |
| 1.2. | Introduction to bacterial and Identification methods | 4 | |
| 1.3. | Rapid biochemical ID: Systems API strips API 20E inoculation and reads API 20E results | 4 | |
| 1.4. | Lab review on fish diseases. Questions and discussions | 3 | |
| Unit 2. | Practice in the Lab: Diagnosis in shrimps diseases | 15 | CO1, CO2, CO3, CO5 |
| 2.1. | Introduction to Laboratory procedures | 3 | |
| 2.2. | Shrimp viral detection: DNA extraction from shrimp samples | 4 | |
| 2.3. | Shrimp viral detection: PCR amplification | 4 | |
| 2.4. | Shrimp viral detection: Electrophoresis Lab review: Questions and discussions | 3 | |

8. Teaching methods:

Theory and practical laboratory
Case study and report from students.
Questions and discussions.

9. Duties of student:

Students have to do the following duties:

- Lecture/Class attendance: 80% of lectures
- Lab. Attendance: 100%

Students should attend oral presentations and all exams

10. Assessment of course learning outcomes:

10.1. Assessment

| No. | Point components | Rules and Requirements | Weights | COs |
|-----|--|--|---------|-------------------------|
| 1 | Scores of short exams/oral presentations | - Mid-term exams - Oral presentation: Written (50%) and oral (50%) presentations will be made | 30% | CO1, CO2, CO5 |
| 2 | Scores of final exam | - Final exam | 70% | CO1, CO2, CO3, CO4, CO5 |

10.2. Grading

- The course grade is the sum of all components of the assessment multiplied by the respective weights. Subject scores are graded on a 10-point scale and rounded to one decimal place, then converted to A-B-C-D and a 4-point scale according to the University's training regulations.

11. Learning materials:

| Learning materials information | Barcode number |
|---|---------------------------|
| [1] Tu Tha Dung, Tran Thi Tuyet Hoa, 2018. Lecture notes | MOL076780; MOL50087567 |
| [2] Edward J. Noga 2010. Fish Disease: Diagnosis and Treatment Wiley–Blackwell Publishing. Second edition, 519 pages | TS004605;639.3/N774 |
| [3] Melba G. Bondad-Reantaso (2001). Asia Diagnostic Guide to Aquatic Animal Diseases. FAO fisheries technical paper 402/2. | 639.964A832 TS003251 |

12. Self-study Guide

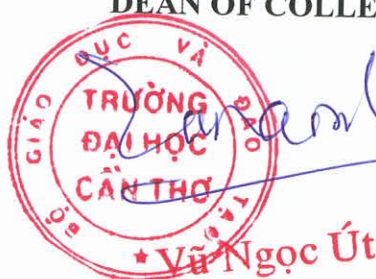
| Week | Content | Theory (hours) | Practice (hours) | Student's Tasks |
|------|---|----------------|------------------|---|
| | Chapter 1: General introduction disease in aquaculture and concepts of aquatic animal health management. | 10 | 4 | Reading lecture notes and Textbooks: [1] - Chapter I [2]- Part I: Health management 69, [3] – Part 1, pages: 11-46 |
| 1 | 1.1. General introduction aquatic diseases in Vietnam and around the world | 2 | | Reading lecture notes and, Textbooks: [1] - Chapter I |

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|---|---|----|----|--|
| | | | | <p>[3]www.fao.org/docrep/005/Y1679E/Y1679E00.HTM.</p> <p>[4]- http://www.oie.int</p> |
| 2 | 1.2. Basic principles of aquatic animal pathology and understand interactions between the host the environment, pathogens and disease development | 5 | | <p>Reading lecture notes and Textbooks:</p> <p>[1]- Chapter I</p> <p>[2]- Part1.5. Environment, stress and fish disease, 65.</p> <p>[3]www.fao.org/docrep/005/Y1679E/Y1679E00.HTM</p> |
| 3 | 1.3. Principles of disease diagnosis and therapy in aquaculture | 3 | 4 | <p>Reading lecture notes and Textbooks:</p> <p>[1]- Chapter I</p> <p>[2]- Parts III. Methods for treating fish disease: General concepts in therapy, 347; Pharmacopoeia, 375</p> <p>[4]- http://www.oie.int</p> |
| 4 | 1.4. Questions and student presentation Short examination | 1 | | Lecture review |
| | Chapter 2: Fish diseases | 25 | 11 | ... |
| 5 | 2.1. Introduction diagnostic techniques, control and management for specific infectious diseases on Marine/tropical fish: Viral, bacterial diseases of the world with an emphasis on those of Vietnam | 5 | 6 | <p>Reading lecture notes and Textbooks:</p> <p>[1]- Chapter II</p> <p>[2] Part I: Clinical workup, 13; Postmortem techniques 49; Health management, 69. Part II. Problems 1, 2: Diagnoses made with/by...</p> <p>[2]- Part II. Problems 45-57, 77-88; (pages: 183-210 and 269-298)</p> <p>[3]www.fao.org/docrep/005/Y1679E/Y1679E00.HTM.</p> |

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|---|---|----|----|---|
| | | | | [4]- http://www.oie.int [5] – Parts: 1-16, |
| 6 | 2.2. Introduction diagnostic techniques, control and management for specific infectious diseases on Marine/tropical fish: fungal and parasitic diseases. | 10 | 5 | Reading lecture notes and Textbooks: [1]- Chapter II [2]- Part II. Problems 45-57, 77-88; (pages: 183-210 and 269-298) [2] - Problems 58-76; pages 215-264. [3] www.fao.org/docrep/005/Y1679E/Y1679E00.HTM . [4]- http://www.oie.int [5] – Part 18, pages: 669-720 |
| | 2.3. Introduction diagnostic techniques, control and management for specific non-infectious diseases and others on fish. Review Chapter 1 and 2. Introduction topic presentations student topic presentations and discussion Short examination | 3 | | Reading lecture notes and Textbooks: [1]- Chapter II [2]- Part II. Problems 89-99, Pages: 305-330 Lecture review |
| | Chapter III. Shrimp diseases | 20 | 15 | |
| 7 | 2.4. Introduction to common viral diseases in cultured shrimp | 10 | 10 | Reading lecture notes and Textbooks: [1]- Chapter II [3]-Section 4-C2 [4]- Section 2.2 |
| 8 | 2.5. Introduction to common diseases in cultured shrimp: bacterial, fungal and parasitic diseases. | 5 | 5 | Reading lecture notes and Textbooks: [1]- Chapter II [3]-Section 4-C2 [4]- Section 2.2 |

| | | | | |
|----|---|----|--|---|
| 9 | 2.6. Introduction to non-infectious diseases in shrimp. Common diagnostic techniques, and control methods of shrimp diseases | 10 | | Reading lecture notes and Textbooks: [1]- Chapter II [3]-Section 2-F1; Section 4-C1 [4]- Section 2.2 |
| 10 | 2.7. Student topic presentations and discussions | 3 | | Lecture review |

ON BEHALF OF RECTOR
DEAN OF COLLEGE



Can Tho, 30.../...8.../2022
HEAD OF DEPARTMENT


Trần Thị Tuyết Hoa