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**Quality Assurance and Curriculum Development**

**Course Book**

**2024 - 2025**

**Department: Fish resources and aquatic animals**

**College: Agricultural engineering sciences**

**Academic year: 2024-2025**

**Academic staff:**

**Email:** [**ayub.anwar@su.edu.krd**](mailto:ayub.anwar@su.edu.krd)

**Course Description**

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| **Module** | **Language** |
| Principle of Ichthyology | English |
| **Academic Year** | **Semester:** |
| 2024-2025 | Fall |
| **ECTS** | **Prerequisite:** |
| 6 | - |
| **Course Objective** | |
| First: To understand the fish history, Taxonomy, and the important species of the fish.  Second: To be familiar with fish group’s e.g. Marine fish, Freshwater fish brackish water fish.  Third: To have enough information on fish biology, physiology, histology and external morphology of the fish and also internal anatomy of fish.  Fourth: To have knowledge about aquatic animals and aquatic environment.  Fifth: To have a general idea on Ornamental fish, Biological characteristic and its diversity.  Sixth; To understand the life cycle of fish’s and other aquatic animals  Seventh: Fish and shellfish and other aquatic species as important source of food for humanity. | |
| **Learning Outcomes** | |
| 1. This course is essential for students who are studying in fish resource and Aquatic animals department. To have adequate information on the fish sciences including freshwater and marine species (Aquaculture and Fisheries), the course provides basic information through lectures, practical, seminars and field trip. 2. Also, gives a brief introduction on Shellfish; crustacean, molluscan and bivalves. Provide and understanding the distribution and classification of the fish relating to their geographical place in the world. To provide a theoretical and practical introduction to the study of the fish science, the fish lectures cover internal and external anatomy, biology, physiology, reproduction and ecology. 3. Obtain practical experiences in studying the local fish species, to have brief information about the fish such as; introductory text, distribution, habitat, size, breeding and status. | |
| **References: \*** | |
| **Primary resources:**  Bostock, J. McAndrew, B. Randolph, R. Jauncey, K. Telfer, T. Lorenzen, K. Little, D. Ross, L. Handisyde, N. Gatward I. Corner R., (2010) Aquaculture: global status and trends. Philosophical Transanctions Of The Royal Society; Biological Sciences, 365: 2897-2912.  Helfman, G.S. Collette, B.B. Facey, D.E. Bowen, B.W. (2009) The diversity of fishes, biology, evolution and ecology. Second edition. 2009. ChiChester , West Sussex, UK.  Barnabe, G., (2005) Aquaculture, biology and ecology of cultured species. Hertfordshire, UK.  Billard, R., (1995) Carp: Biology and Culture. © IRNA, Paris1995.  Globefish website: www.globefish.org  Food and Agriculture Organization, (2016) The State of World Fisheries and Aquaculture, Rome. | |
| **Type of Teaching: \*** | |
| In this section the lecturer shall write the role of students and their obligations throughout the academic year, for example the attendance and completion of all tests, exams, assignments, reports , essays…etc. Students must attend in all lessons and theory/ practical exams. Writing report, participating filed trips. | |
| **Requirements For Credit Points: \*** | |
| 1. Student attendance in class is important. 2. Discussion in class is necessary. 3. Assignments for each lesson 4. Mid-term examination 5. Report 6. Quiz 7. Lab activity | |
| **Grade Distribution: \*** | |
| **Assessment Breakdown and Structure**  **Effort Component (50%),** in the first round of assessment, students will engage in a comprehensive blend of practical and theoretical evaluations. The breakdown is as follows:  **Practical Exams**: All practical exams will be conducted in the classroom to assess students' applied skills.  **Attend and daily activities (5 marks):** This includes active classroom participation, selecting and engaging in debate topics, and collaborative group work.  **Theoretical Exam (Quiz)**: A single written exam, worth (**5 marks**), will evaluate students' understanding of theoretical concepts.  **Academic Report (15 marks):** Students are required to submit a detailed report that demonstrates their analytical and writing skills.  **Seminar Presentation (10 marks):** Each student will present a seminar based on their report, showcasing their ability to communicate and defend their work effectively.  In addition to **Searching for sources (6 marks), Use of technology (4 marks), and Problem-solving (5 marks).** These activities collectively account for **50%** of the total effort mark, emphasizing continuous learning and participation.  **Final Examination (50%),** the final exam will test students' ability to synthesize and present information in various formats. The structure includes:  **Academic Poster (20 marks):** Students will design and prepare an academic poster that concisely presents key research findings or project insights.  **Debate (30 marks):** Students will participate in a structured debate, demonstrating their critical thinking, argumentation, and engagement with complex topics.  **Second Round (Individual Effort)**  In the second round, all assessments will be completed independently by the student, ensuring a comprehensive evaluation of their skills. The breakdown is as follows:  **Report Writing (20 marks)**: A revised and detailed report submission.  **Academic Poster Preparation (10 marks):** A standalone poster that communicates their research effectively.  **Seminar Presentation (20marks):** A presentation based on their report, focusing on clear articulation and in-depth understanding. This approach guarantees a balanced evaluation that promotes both collaborative and individual competencies. | |

**Weekly Plan**

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| **The Topics:** | **Lecturer's name** |
| History of Ichthyology | Dr.Ayub Younis Anwar |
| Jawless Fish | Dr.Ayub Younis Anwar |
| Bony Fish | Dr.Ayub Younis Anwar |
| Cartilage Fish | Dr.Ayub Younis Anwar |
| Diversity of Fish (Species, Habitat) | Dr.Ayub Younis Anwar |
| Diversity of Fish (Life Span, Size) | Dr.Ayub Younis Anwar |
| Diversity of Fish (Brooding, Breeding, Feeding) | Dr.Ayub Younis Anwar |
| Mid Exam | Dr.Ayub Younis Anwar |
| Diversity of Fish (Vision, locomotion) | Dr.Ayub Younis Anwar |
| Field Trip | Dr.Ayub Younis Anwar |
| Diversity of Fish (Toxicity, Human use) | Dr.Ayub Younis Anwar |
| World Ornamental Fish | Dr.Ayub Younis Anwar |
| Kurdistan Ornamental Fish | Dr.Ayub Younis Anwar |
| Iraqi and Kurdistan Region Fish | Dr.Ayub Younis Anwar |
| Final Exam | Dr.Ayub Younis Anwar |
| **18. Practical Topics (If there is any)** |  |
| General Characteristics of jawless; Body shape, coloration, senses | Dr.Safen Osman |
| General Characteristics of cartilage; Body shape, coloration, senses | Dr.Safen Osman |
| General Characteristics of bonyfish; Body shape, coloration, senses | Dr.Safen Osman |
| External Characteristics of jawless,; Head, fins, mouth shapes, tail, skin, scale and fish measurement | Dr.Safen Osman |
| External Characteristics of cartilage; Head, fins, mouth shapes, tail, skin, scale and fish measurement | Dr.Safen Osman |
| External Characteristics of bony fish; Head, fins, mouth shapes, tail, skin, scale and fish measurement | Dr.Safen Osman |
| Midterm Exam | Dr.Safen Osman |
| Internal anatomy of jawless, cartilage and bony fish | Dr.Safen Osman |
| Skeleton & Cartilage system & Digestive system | Dr.Safen Osman |
| Visit to hatchery station in Erbil | Dr.Safen Osman |
| Circulatory systems | Dr.Safen Osman |
| Immune and nerves systems | Dr.Safen Osman |
| Reproduction system | Dr.Safen Osman |
| Respiratory systems | Dr.Safen Osman |
| Final Exam | Dr.Safen Osman |

**Workload**

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| --- | --- | --- | --- |
| **Module\*** | | | |
| **Prerequisite:** | | | |
| **Detail** | | | |
| **Type** | **Number** | **Time Factor** | **Total** |
| **Attendance** | **14** | **4hr** | **14 \*4 = 56** |
| **Academic Report** | **1** | **14hr** | **1\*14 = 14** |
| **Quiz** | **1** | **6hr** | **1\*6 = 6** |
| **Seminar** | **1** | **10hr** | **1\*10 = 10** |
| **Searching for Resources** | **2** | **6hr** | **2\*6 = 6** |
| **Technology Use** | **2** | **6hr** | **2\*6 = 16** |
| **Problem-Solving** | **2** | **8hr** | **2\*8 = 16** |
| **Academic Poster** | **1** | **12hr** | **1\*12 = 12** |
| **Lab activity** | **1** | **26hr** | **1\*26 = 26** |
|  |  |  | **162 hr.** |