

Course description template for fish principles

1. Course Name:	
Principles of fish	
2. Course Code:	

3. Semester / Year:	
Autumn semester 2023–2024	
4. Description Preparation Date:	
1/9/2023	
5. Available Attendance Forms:	
My presence	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical + 3 practical/3.5 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Nidhal Tahseen Taha Al-Taee Email: nidhal_tahseen@uomosul.edu.iq Hani hashim Mohammed haniap@uomosul.edu.iq	
8. Course Objectives	
Course Objectives theoretical: 1- We enable the student to understand and comprehend what fish science is 2- Enabling the student to know the types and varieties of fish 3- Enabling the student to know fish science and the sciences related to it 4- Enabling the student to learn about the life of fish 5- Enabling the student to learn about the fish environment 6- Enable the student to know the livelihood and growth of fish	practical: 1- Enabling the student to learn about fish classification methods 2- Enable the student to estimate the growth and age of fish 3- Enabling the student to know the influences on the fish environment 4- Enable the student to know the characteristics of fish living water
9. Teaching and Learning Strategies	
theoretical: - Interactive lecture - Brainstorming - Dialogue and discussion - Assigning tasks and submitting reports - Displaying pictures and shapes of fish through the smart board	practical: - Assigning work in groups to rev leadership skills - Assigning tasks and reports for ea practical lesson

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical 3 practical	The student learns what fish are, ichthyology, related sciences, and their types	Theoretical: Introduction - Ichthyology - the science specialized in the study of fish. Practical: classification of fish, external appearance of fish.	Theoretical: the methods used Audio explaining the topic Visual mediated presentation via Power Point Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on classification. Assigning each student to prepare a lecture within the curriculum
2	2 Theoretical 3 practical	What groups of organisms in the aquatic environment it includes Classify fish	Theoretical: The general groups of living animals included in the definition of fish - the shape of fish and fins - internal characteristics - the main classes of fish - the jawless class - the cartilaginous fish class - the bony fish class. Practical: Body parts of a fish	Theoretical: the methods used Audio explaining the topic Visual mediated presentation via Power Point Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on the division of fish in the aquatic environment. Assigning each student to prepare a lecture within the curriculum.
3	2 Theoretical 3 practical	The effect of water quality characteristics includes the physical water characteristics affecting the life of fish in the aquatic environment	Theoretical: Relationships between fish and living and non-living factors. Firstly, fish adaptations to non-living environmental factors 1. Density and pressure in water. 2. Salinity. 3. Water temperature. 4. Dissolved gases. 5. Light. 6. Water movement and turbidity. 7. Sound and its transmission in aqueous medium.	Theoretical: the methods used Audio explaining the topic Visual mediated presentation via Power Point Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on the division of fish in the aquatic environment. Assigning each student to prepare a lecture within the curriculum.

			Practical: fish body openings.		
4	2 Theoretical 3 practical	Teach the student about the living relationships between the same species and other species that live in the same aquatic environment.	Theoretical: Relationships between fish and living and non-living factors 8. Electrical and electromagnetic currents in aqueous media. 9. The nature of the bottom. Second: Live relationships between fish: 1. Relationships within a single species. 2. Relationships between different species of fish. a. Predation b. Intrusion c. Competition d. Eating E. Mutual benefit. Practical: respiratory system	Theoretical: the method used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on the relationships between fish and living and non-living factors. Assigning each student to prepare a lecture within the curriculum.
5	2 Theoretical 3 practical	The student learns the types of foods you eat based on your nutritional habits	Theoretical: Food and feeding habits: Feeding habits - the locations of the different organisms that fish feed on in the aquatic environment - the rate of food seeking - the rate of food conversion - methods of studying feeding habits - 1. Predators. 2. Grazer 3. Filter 4. Absorbent 5. Parasitoid. Practical: Circulatory device	Theoretical: the method used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on food and eating habits. Assigning each student to prepare a lecture within the curriculum.
6	2 Theoretical 3 practical	Identify the natural food that fish eat in their natural environment, including the food chain within the water body	Theoretical: The nutritional and other relationships of fish - phytoplankton and zooplankton - the nutritional nature of fish and their relationship to the	Theoretical: the method used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student

			environmental environment - examples of the diversity of the dietary pattern of fish according to the environment - the food pyramid - enemies of fish. Practical: digestive system.	Practical: assignment Practical tasks in the laboratory Write a report on the lesson	to prepare a seminar on the nutritional and other relationships of fish. Assigning each student to prepare a lecture within the curriculum.
7	2 Theoretical 3 practical	The student learns about the digestive process carried out by fish based on their eating habits, which is linked to the shape of the digestive canal	Theoretical: The process of digestion and excretion of waste in fish: Digestion - parts of the digestive canal - digestion process - excretion of wastes - excretion of nitrogenous substances in lungfish. Practical: muscular system	Theoretical: the methods used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on the process of digestion and excretion of waste in fish. Assigning each student to prepare a lecture within the curriculum.
8	2 Theoretical 3 practical	Explain to the student what is meant by fish growth and what are the internal and external factors affecting it.	Theoretical: Growth: Definition of growth - Metabolic energy - Factors affecting growth: 1. Internal growth factors Practical: skeletal system	Theoretical: the methods used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on growth and define growth. Assigning each student to prepare a lecture within the curriculum.
9	2 Theoretical 3 practical	To determine the extent of students' understanding of the curriculum by setting questions that take into account the different levels of students' level.	2. External growth factors are: 1. Environmental factors that affect growth, such as water temperature, oxygen, ammonia, salinity, and photoperiod. 2. Degree of competition 3. Quantity and quality of food consumed. 4. The age and state of	Theoretical: the methods used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, the first monthly exam, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on external growth factors. Assigning each student to prepare a

			maturity of the fish Practical: nervous system		lecture within the curriculum.
10	2 Theoretical 3 practical	Fish live in different environments, including salty, brackish, and fresh. Introducing the student to the most important strategies that they follow to maintain their osmotic pressure so that they can survive.	Theoretical: Osmotic pressure: Osmoregulation - Osmoregulation in marine gillfish fish - Osmoregulation in marine fully ossified fish - Osmoregulation in freshwater fish - Dimigratory fish. Practical: excretory (urinary) system	Theoretical: the method used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on osmotic pressure and osmoregulation in fish. Assigning each student to prepare a lecture within the curriculum.
11	2 Theoretical 3 practical	Introducing the student to the methods followed by fish species to be able to maintain their neutral weight in the environment in which they live.	Theoretical: Buoyancy mechanism in fish - Specific density - Gas bladder - Lipids - Types of buoyancy found in fish 1. Squalene 2. Wax esters. Practical: Reproductive system and reproduction	Theoretical: the method used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on the mechanism of buoyancy in fish. Assigning each student to prepare a lecture within the curriculum.
12	2 Theoretical 3 practical	The student learns about the methods followed by fish in reproduction, which vary according to the type of fish and are called reproductive strategies.	Theoretical: Reproductive reproduction: reproductive strategy and its requirements - environmental conditions stimulating fish reproduction - physiological response of fish for the purpose of reproduction - stages of life history after hatching of fish 3. Aging - terms used in the history of fish - male sex cells - shape and size of fish eggs - places where eggs are laid in the	Theoretical: the method used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture. Assign each student to prepare a seminar on reproduction and reproductive strategy. Assigning each student to prepare a lecture within the curriculum.

			<p>aquatic environment - Collective method of ablation.</p> <p>Practical: method of collecting fish samples.</p>		
13	2 Theoretical 3 practical	The student learns about reproductive strategies in fish. The negative effects of pollutants on aquatic organisms and the extent of their transmission through the food chain to humans consuming these meats.	<p>Theoretical: 1- Advantages of keeping eggs, internal incubation, and the birth of young - Characteristics of oviparous fish - Modifications of reproductive organs in ovoviviparous fish - Examples of ovoviviparous fish - Nutrition of embryos in viviparous fish - Sexual differentiation and sexual differences - Hermaphrodite fish - Simultaneous or sequential hermaphrodite fish.</p> <p>2- Pollution: Definition of pollution - types of pollution.</p> <p>Practical: Animal geography, some important definitions</p>	<p>Theoretical: the method used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue</p> <p>Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson</p>	<p>Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture.</p> <p>Assign each student to prepare a seminar on pollution: definition of pollution - types of pollution.</p> <p>Assigning each student to prepare a lecture within the curriculum.</p>
14	2 Theoretical 3 practical	The student learns about the behaviors of fish in their environment	<p>Theoretical: Fish behaviors according to the environment in which they live, such as electric fish.</p> <p>Practical: Mechanics of light production in luminous organisms in fish.</p>	<p>Theoretical: the method used Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue</p> <p>Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson</p>	<p>Exams, reports, discussions, quizzes, preparing reports by students about the lecture and assigning them to solve questions about the lecture.</p> <p>Assigning each student to prepare a seminar on fish behavior within the environment</p> <p>Assigning each student to prepare a lecture within the curriculum.</p>
15	2 Theoretical 3 practical	To know the reasons for fish migration in	Theoretical: Fish migration and the	Theoretical: the method used	Exams, second month exam, reports,

	the aquatic environment, and the behavior of fish swarms	purpose of migration in water bodies Practical: migration, swarm behavior	Audio explaining the topic Visual mediated presentation via PowerPoint Writing on the board Direct dialogue Practical: Student assignment Practical tasks in the laboratory Write a report on the lesson	discussions, quizzes, preparing reports on the motivation leading to fish migration in the aquatic environment. Assign each student to prepare a seminar on the division of fish in the aquatic environment. Assigning each student to prepare a lecture within the curriculum.
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11. Course Evaluation

1	Evaluation methods	Evaluation date (one week)	Degree	
2	A theoretical final report Practical experience reports	Week 15 Week from 1 to 15	7 theoretical + 6 practical	%13
3	Short test (1) Quiz	Week 3	Theoretical 4 + Practical 2	%6
4	Midterm Exam	Week 9	Theoretical 10 + 5 practical	%15
5	Short test (1) Quiz	Week 12	Theoretical 4 + Practical 2	%6
6	Final practical test	Practical exam week	20	%20
7	Final theoretical test	The week of theoretical exams	40	%40
8	The total		100	%100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fish breeding and production / Mahfouz Hussein Salman / University of Mosul
Main references (sources)	Fish breeding and production / Muhammad Adel et al Breeding and management of fish farms / Kazem Abdel Amir Fish diseases and parasites / Farhan Damad Muhaisen
Recommended books and references (scientific journals, reports...)	Lectures published by Iraqi universities Al-Rafidain Agriculture Journal / College of Agriculture and Forestry Agricultural magazines issued by agricultural colleges
Electronic References, Websites	International Agriculture Organization (FAO) Website Environment Organization (UNDP).

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