

**Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department**



Academic Program and Course Description Guide

2025

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name **University of Basrah**

Faculty / Institute **College of Agriculture**

Scientific Department **Department of Fisheries and Marine Resources**

Academic or Professional Program Name **Fisheries and Marine Resources**

Final Certificate Name **Bachelors in Fisheries and Marine Resources**

Academic System **Semester System**

Description Preparation Date 10 June 2026

File Completion Date 21 June 2026



Head of Department Name:

Prof. Dr. Khalidah Salim khaudeyer

Date 21 June 2026



Scientific Associate Name

Prof. Dr. Sadiq Jabar Muhsin

21 June 2026

Signature



This File Is Checked by Prof. Dr. Aqeel Abbood Suhaim

Department of Quality Assurance and University Performance

Director of the Department of Quality Assurance and University Performance

Date 21 June 2026



Prof Dr Sarmad Ghazi Mohammed

Approval of The Dean

Fisheries and Marine Resources Departments looks forward to a leading role to promote education and scientific research and community service in the field of Fisheries and Marine Resources.

The department plays a big role to be a pattern of distinction in providing high-quality education supported locally and globally and keep pace with the times by providing academic environment where students and faculty interact to create appropriate educational ambience.

2. Program Mission

The mission of the Fisheries and Marine Resources Department is to provide a premium and contemporary education to prepare graduates as professionals capable of identifying, evaluating, and solving complex and multi-layered problems in the field of environmental science and engineering, to conduct and encourage fundamental and applied research with a focus of designing and implementing sound, feasible, and sustainable engineering solutions to the environmental real-world issues, to build-up the proficient expertise with a global, inter- disciplinary, and innovative perspective, to be a competent actor coordinating with the public administration, the industry, and the other local, national and, international bodies for implementation of the generated sustainable solutions.

3. Program Objectives

The Fisheries and Marine Resources Department will:

Create, disseminate and integrate knowledge of engineering, science and technology that expands our Fisheries and Marine Resources knowledge base, which in turn enables the betterment of human society.

Develop and transfer innovative applications of engineering, science and technology to improve Fisheries and Marine Resources practice.

Recognized by our peers as a highly effective leader in the conducted interdisciplinary research and the development of innovative approaches to solve Fisheries and Marine Resources problems.

Attract and welcome undergraduate students to our Bachelor of Science program in Fisheries and Marine Resources, and to graduate B.S. students who are innovative problem solvers, who become leaders in their organizations, and who possess the knowledge and skills required for a wide range of careers and career changes.

Maintain an intellectually challenging, yet supportive and welcoming environment that encourages and enables our students, faculty and staff to achieve their best in a diverse community.

Concentrating on scientific research and its leading role in helping to serve the society and solving its problems through conducting application researches.

Continuous development of curricula and studying plans for all stages and levels of studying at the Department to keep up with the latest developments in Fisheries and Marine Resources.

Cooperating with related public sector institutions to supply scientific and engineering advice, and preparing different training courses in the development and capacity building for their engineering staffs.

4. Program Accreditation

Seeking accreditation.

5. Other External Influences

Opportunities for support

6. Program Structure

Program Structure	Number of Courses	Credit Hours	Percentage	Reviews*
Institution Requirements	6	14	9%	
College Requirements	8	19	12%	Basic
Department Requirements	42	131	80%	Basic
Summer Training	1	0		Basic
Others				

*This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
First stage First course	Biodiversity	001110	2	
	Mathematics	0C1110	3	
	General Chemistry	001110	2	3
	Economic Crops	001110	2	3
	Democracy & Human Rights	U01110	2	

	Computer 1	U01110	1	1
	English language 1	U01110	2	
First stage Second course	Zoology	002110	2	3
	Ecology	002110	2	3
	Hydrology	002110	2	3
	Engineering drawing	002110		3
	Arabic language	U02110	1	
Second stage First course	Basics of Biotechnology	001120	2	3
	Aquatic Ecology	001120	2	3
	Ichthyology	001120	2	3
	Fundamentals of Aquatic Insects	001120	2	3
	Baath Crimes	U01120	2	
	Commercial Fisheries Techniques	001120	2	
	English Language 2	U01120	2	
	Computer2	U01120	1	1
	Field Practice 1	001120		3
Second stage Second course	Fish feeding techniques	002120	2	3
	Classification techniques for Chondrichthyes	002120	2	3
	organic chemistry	002120	2	3
	Bio-Statistics Applications	002120	2	3
	Ornamental fish production techniques	002120	2	3
	Field practice 2	002120		3
	Sediments	002120	2	3
Third stage First course	Fish Biology	001130	2	3

	Classification of Osteichthyes	001130	2	3
	Aquatic physiology	001130	2	3
	Fish feed technology	001130	2	3
	Design and analysis of experiments	0C1130	2	3
	Marsh and wetland environment	001130	2	3
Third stage Second course	Fish stock program	002130	2	3
	Invertebrates	002130	2	3
	Fish genetic engineering	002130	2	3
	Biochemistry	0C2130	2	3
	Limnology	002130	2	3
	Fish farm engineering	002130	2	3
	Extension and agricultural techniques	0C2130	2	
Fourth stage First course	Fish diseases and parasites	001140	2	3
	Aquaculture techniques	001140	2	3
	Marine and estuarine environment	001140	2	3
	Planktology	001140	2	3
	Aquatic plants	001140	1	2
	Economics of fish marketing	001140	2	
	Seminars	001140	1	
	Agricultural project1	001140		3
Fourth stage	Marine Biology	002140	2	3

Second course	Fish Breeding Techniques	002140	2	3
	Fish Technology	002140	2	
	Fisheries Resources Management	002140	2	3
	Laboratory techniques	002140	2	3
	Pollution of the aquatic environment	002140	2	3
	Agricultural projects2	002140		3

8. Expected Learning Outcomes of Program

Knowledge

A1- The basics of culture and propagating aquatic organisms and manufacturing feeds.	Learn the basic principles of culture and propagating fish and aquatic organisms and manufacturing feed using modern methods.
A2- The basics of fisheries and fresh and marine water aquatic resources.	Learn the basic principles of fishing, aquatic life, and exploiting the biological resources found in fresh and marine water bodies using modern methods.
A3- The basics of the aquatic environment, its preservation, and the problems of water pollution.	Learn the basic principles of preserving the aquatic environment, environmental diversity, sustainability, and avoiding environmental pollutants and their negative effects.
A4- Knowledge of modern applications in the above fields.	Identify modern and advanced applications in the fields of knowledge related to fish farming and fisheries.

Skills

B1- Skills of culture, propagating and feeding aquatic organisms.	The ability to establish and manage fish and aquatic life farms, determine the nutritional needs of aquatic organisms, and manufacture their feed using modern methods and using low-cost feed sources that meet their actual needs.
B2- Skills in catching aquatic organisms, enhancing stocks, and benefiting from fisheries in a sustainable manner.	The ability to use correct and effective methods in catching aquatic organisms and identify fishery sites that can be used, with the ability to estimate the stock and the possible percentage of use from it, and determine the appropriate fishing times and the times at which fishing activities must be stopped to preserve the stock or places that need activities to enhance the stock.

B3- Skills for dealing with the aquatic environment in the correct ways and preserving it.	The ability to assess the state of the aquatic environment, detect imbalances and pollution that occur in it, and develop plans and procedures to correct them or reduce their negative effects on the aquatic organisms present in them.
B4- Skills in using modern and advanced applications and methods in the field of culture, fisheries and the environment.	The ability to use the latest methods with regard to culture and catching aquatic organisms and their environment, such as culturing fish and aquatic organisms in closed and intensive systems, using genetic techniques and feed manufacturing techniques to increase productivity, as well as using advanced fishing methods and exploiting fisheries in modern ways to prevent their depletion and maintain their sustainability, and learning to use modern and advanced techniques in monitoring the aquatic environment and discovering imbalances and pollution that occur in it early to prevent them or reduce their negative effects.
Ethics	
C1- Providing study programs that suit the needs of society, the labor market, and lifelong education.	The department's academic program seeks to be distinguished by providing study programs appropriate to the needs of society from academic cadres who possess the moral and cognitive values to develop the country and lead the wheel of agricultural production and food security.
C2- Devoting the creativity and innovation capabilities of students.	The department's academic program seeks to devote the creativity and innovation capabilities of students to meet the challenges they will face after their graduation and during their working lives, whether in the public or private sector, by developing their abilities and motivating them to analyze problems and program appropriate solutions to them.
C3- Working as a team.	The department's academic program seeks to instill a culture of team work among the department's students and cooperate in overcoming the difficulties they face in their academic life or after their graduation, as well as strengthening their ties with the program's teaching staff and giving them the opportunity to benefit from their professors in all aspects, whether cognitive, social, or personal.
C4- Possessing the correct moral values in professional and social dealings.	The department's academic program seeks to instill the correct moral values in students from a professional standpoint in their dealings with the labor market and its requirements or in their dealings with the society in which they will practice their professional activities.

9. Teaching and Learning Strategies

This is done through theoretical and practical lectures related to the curriculum, as well as the scientific application of lessons that require it. It is achieved through methods of discussion and debate, directing questions to students, using modern presentation tools, organizing festivals, and employing modern methods and techniques in teaching methods.

1. Lecture
2. Discussion and dialogue
3. Enrichment questions
4. Direct questioning

10. Evaluation Methods

- Periodic, monthly, and daily exams.
- Field practice.
- Discussion of graduation projects.
- Extracurricular activities.
- Various homework assignments and writing scientific reports on practical laboratory experiments.

11. Faculty

Faculty Members

Academic Title	Specialization		Special Requirements /Skills (If Applicable)		Number of Teaching Staff	
	General	Special			Staff	Lecturer
Professor	Biology	Fish diseases and health			1	
Professor	Fisheries & Marine Resources	Fish environment and habitat			1	
Professor	Fisheries & Marine Resources	Fish parasites			1	
Professor	Fisheries & Marine Resources	Fishery resource management			1	
Professor	Fisheries & Marine Resources	Fish nutrition physiology			1	
Professor	Fisheries & Marine Resources	Fish farming and nutrition			1	
Associate Professor	Fisheries & Marine Resources	Aquatic environment			1	

Associate Professor	Fisheries & Marine Resources	Fish physiology			1	
Associate Professor	Fisheries & Marine Resources	Fish parasites			1	
Associate Professor	Fisheries & Marine Resources	Environment and pollution			1	
Associate Professor	Fisheries & Marine Resources	Fish ecology			1	
Lecturer	Biology	Aquatic environment			1	
Lecturer	Fisheries & Marine Resources	Fish physiology			2	
Lecturer	Fisheries & Marine Resources	Fish ecology			1	
Assistant Lecturer	Fisheries & Marine Resources	Fish environment			1	
Professor	Fisheries & Marine Resources	Fish nutrition			1	
Professor	Fisheries & Marine Resources	Fish farming			1	
Professor	Fisheries & Marine Resources	Fish technology and feeds			1	
Lecturer	Fisheries & Marine Resources	Fish farming			1	
Lecturer	Fisheries & Marine Resources	Fish farming and nutrition			1	
Experienced Professor	Fisheries & Marine Resources	Fish aggregations				1
Assistant Lecturer	Fisheries & Marine Resources	Mathematics				1
Associate Professor	Fisheries & Marine Resources	Soil and water sciences				1
Lecturer	Mathematics	Food sciences				1
Lecturer	Soil and water sciences	History				1
Associate Professor	Food science	Food sciences				1
Associate Professor	Humanitarian Education	Plant protection				1

Professional Development

Monitoring New Faculty Members

- ✓ Guiding new faculty members into academic work.
- ✓ Working on diversifying classroom management methods and involving them in practical lectures and presentations.
- ✓ Conducting personal interviews to assess the teaching competence and skills of the faculty member.
- ✓ Involving them in publishing research in internationally recognized journals with impact factors, writing books, and participating in workshops and conferences.

Professional Development for Faculty Members

- 1- Communicating newly acquired knowledge, information, and research findings to the faculty and linking them to daily work experiences.
- 2- Providing educational opportunities for faculty members to access and gain new information, knowledge, and modern experiences for professional growth.
- 3- Establishing integration between continuing education programs and production, health, and professional institutions.
- 4- Achieving integration between formal education and continuing education through the development of methods and formats that ensure this integration.

12. Acceptance Criterion

- 1- Admission requirements for the college:

The admission process follows the guidelines and procedures set by the Ministry of Higher Education and Scientific Research - Central Admission Department. Graduates of the preparatory stage (scientific branch) are nominated for admission to the college based on their graduation averages.

- 2- Admission requirements for the scientific department:

Students are allowed to select their preferred department from among multiple options based on priority.

The student's GPA in the desired department is taken into consideration.

The capacity and enrollment limit of the scientific department are considered during the admission process.

13. The Most Important Sources of Information About The Program

- 1- Websites of Iraqi and foreign universities.
- 2- Academic program guide.
- 3- Scientific libraries.
- 4- Workshops conducted by the Ministry of Higher Education.

14. Program Development Plan

- ✓ Regular evaluation and review of the program, based on recommendations or proposals resulting from the annual reports of the programs and course reports.
- ✓ Developments that have occurred in the field of the program in terms of scientific and technological aspects, as well as research recommendations and studies.
- ✓ Market variables, available job opportunities, and their requirements.
- ✓ Recommendations from the university or external institutions for the development of existing programs.
- ✓ Results of surveys conducted among the beneficiaries of the graduates.
- ✓ Passage of five years or more since the implementation of the curriculum and completion of the feedback loop.

Program Skills outline															
				Required Program Learning Outcomes											
Year/Level	Course Code	Course Name	Basic or Optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First stage	001110	Biodiversity	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	0C1110	Mathematics	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	0C1110	General Chemistry	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	0C1110	Economic Crops	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	U01110	Democracy & Human Rights	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	U01110	Computer 1	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	U01110	English language 1	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002110	Zoology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002110	Ecology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002110	Hydrology	Basic	√	√	√	√	√	√	√	√	√	√	√	√

Second stage	0C2110	Engineering drawing	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	U02110	Arabic language	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001120	Basics of Biotechnology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001120	Aquatic Ecology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001120	Ichthyology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001120	Fundamentals of Aquatic Insects	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001120	Baath Crimes	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001120	Commercial Fisheries Techniques	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	U01120	English Language 2	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	U01120	Computer2	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001120	Field Practice 1	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002120	Fish feeding techniques	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002120	Classification techniques for Chondrichthves	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	0C2120	organic chemistry	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002120	Bio-Statistics Applications	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002120	Ornamental fish production techniques	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002120	Field practice 2	Basic	√	√	√	√	√	√	√	√	√	√	√	√

	002120	Sediments	Basic	√	√	√	√	√	√	√	√	√	√	√	√
Third stage	001130	Fish Biology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001130	Classification of Osteichthyes	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001130	Aquatic physiology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001130	Fish feed technology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	0C1130	Design and analysis of experiments	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001130	Marsh and wetland environment	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002130	Fish stock program	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002130	Invertebrates	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002130	Fish genetic engineering	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002130	Biochemistry	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002130	Limnology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002130	Fish farm engineering	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	0C2130	Extension and agricultural techniques	Basic	√	√	√	√	√	√	√	√	√	√	√	√

Fourth stage	001140	Fish diseases and parasites	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001140	Aquaculture techniques	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001140	Marine and estuarine environment	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001140	Planktology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001140	Aquatic plants	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	001140	Economics of fish marketing	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	0C1140	Seminars	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	0C1140	Agricultural project1	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002140	Marine Biology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002140	Fish Breeding Techniques	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002140	Fish Technology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002140	Fisheries Resources Management	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002140	Laboratory techniques	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	002140	Pollution of the aquatic environment	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	0C2140	Agricultural projects2	Basic	√	√	√	√	√	√	√	√	√	√	√	√

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation

Course Description of Osteichthyes classification

1. Course Name:	
Osteichthyes classification	
2. Course Code:	
001130	
3. Semester / Year:	
First semester/ 2023-2024	
4. Description Preparation Date:	
17 /9/ 2025	
5. Available Attendance Forms:	
Full time (theoretical lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours per week for 14 weeks/ 3.5 units	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Jassim M. Abed	Email:jassim1961abed@gmail.com
8. Course Objectives	
Course Objectives Graduating students who are able to:	• Working in the field of environmental sciences, they have theoretical and applied knowledge of the subject of Fish classification • Obtaining the skills required for a postgraduate plan (postgraduate studies). • Thinking and analysis skills that enable access to knowledge of diagnosing and categorizing wandering species and studying their distribution, density and relationship to the aquatic environment.
9. Teaching and Learning Strategies	
Strategy	1 - Enable students to obtain knowledge and understanding of the relationship of fish to the food chain. 2- Enabling students to obtain knowledge and understanding of fish classification. 3- Enabling students to obtain knowledge and understanding of the methods used in fish collection. 4- Enabling students to obtain knowledge and understanding of how to use the fish classification keys. 5- Introducing the student to laboratory work, applying theoretical information and linking it to the reality of laboratory work

10. Course Structure

Week	Hours	Required learning	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Introduce students to general information about fish classification.	General introduction to fish classification	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
2	5	Introduce students to vertebrates	The phylogeny of vertebrates, the origin and evolution of fish	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
3	5	Explanation and clarification of extinct groups	Placodermi groups of extinct fish	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
4	5	Clarification and explanation of fish for lobed or fleshy fins	Sarcopterygii	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
5	5	Lung fish elucidation and distribution	Lung fish Dipnoi fish	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
6	5	Explanation and clarification of the groups belonging to the	Chondrostei	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
7	5	Explanation and clarification of the groups belonging to	Holostei	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
8	5	Clarification and explanation of modern fully ossified fish	Teleostei	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
9	5	An illustration of the groups belonging to herring	Elopomorpha	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
10	5	Explanation and clarification of the subgroups of Otocephala	Otocephala	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

11	5	Clarification and explanation of the species belonging to the	Cypriniformes	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
12	5	Continuation Clarification and explanation of the species	Cypriniformes	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
13	5	Clarification and explanation of the species belonging to the	Perciformes	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
14	5	Supplement the clarification and explanation of the species	Perciformes	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	N. K. Al- Daham: Fishes of Iraq and the Arabian Gulf (part 1, 2 and 3)
Main References (Sources)	Brian Coad (2010). Freshwater Fishes of Iraq
Recommended Books and References (Scientific Journals, Reports...)	Many research papers have been published on fish classification
Electronic References, Websites	https://www.Fishbase.de

Course Description of Marine Biology

1. Course Name:	
Marine Biology	
2. Course Code:	
002140	
3. Semester / Year:	
Second/ Fourth	
4. Description Preparation Date:	
10/ 1/ 2025	
5. Available Attendance Forms:	
Full time attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5/ 3.5	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Dr. Naeem Shanad Hammadi Email: naeem.hammadi@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	• • Graduating students capable of: • • Working in the field of environmental sciences, they have theoretical and applied knowledge regarding marine biology. • • Obtaining the skills required for the post-graduation plan (postgraduate studies). • • Applying for external tests by local/regional/international bodies. • • Thinking and analytical skills that enable one to achieve knowledge of diagnosing and classifying marine species and studying their distribution and relationship with the aquatic environment. • • Providing students with skills to work in scientific and research laboratories and study marine biology

9. Teaching and Learning Strategies

Strategy	- Enabling students to obtain knowledge and understanding of marine biology. - Enabling students to obtain knowledge and understanding of the relationship between marine organisms. - Enabling students to obtain knowledge and understanding of the methods used in collecting marine life samples - Enabling students to obtain knowledge and understanding of the methods used in classifying marine life types. - Introducing the student to laboratory work, applying theoretical information, and linking it to the reality of laboratory work. - Providing students with the basics and additional topics related to the previous learning outcomes of skills, to solve scientific problems. - Asking students during practical laboratories to diagnose and classify marine organisms. - Students' contribution by actually participating in the tests.
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10. Course Structure

Week	Hours	Required learning	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Introducing students to general information about marine biology.	A general introduction to marine biology.	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
2	5	Introducing students to marine areas.	Major marine areas	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
3	5	Explain and clarify the environmental factors affecting marine life.	Environmental factors affecting marine organisms.	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily

4	5	Introducing students to the division of marine organisms according to depth and the nature of food.	The division of marine organisms according to depth and the nature of food.	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
5	5	Explaining the general characteristics of the rocky tidal zone and its revival	The rocky tidal zone and its revival	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
6	5	Introducing students to the classification of marine organisms.	Classification of marine organisms.	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
7	5	Introducing students to the group of algae.	The group of algae	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
8	5	A detailed explanation of the Phylum of Mollusca.	The Phylum of Mollusca	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
9	5	Introducing the importance of arthropods.	Arthropods.	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily

10	5	Explanation and clarification of coral islands and their revival.	Coral islands and their revival	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
11	5	Introduction to the group of sponges.	The group of sponges	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
12	5	A detailed explanation of the importance of marine mammals.	Marine mammals.	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
13	5	Introducing students to the importance of fish resources and their distribution in marine fish resources.	Marine fish resources.	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
14	5	Explain and clarify the economic importance of marine wealth	The economic importance of marine wealth	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)

-Introductory oceanography ninth. Ed. Harold r. Thurman & Elizabeth A. Burton Prentice Hall 2001

Main References (Sources)	Biotores of the western Arabian Gulf. Marine & Eenviroments of Sudia Arabia Arabian American oil company 1977 A field guide to the sea shores of Kuwait and the - Arabian Gulf. - Wallace, R. L. and T. W. Snell 2001. Ecology and Classification of North American Freshwater Invertebrates, 2nd edition. (Thorpe, J. & Covich, eds.) Academic Press, NY.: 195-254.
Recommended Books and References (Scientific Journals, Reports...)	Research, university theses, and various taxonomic websites dealing with marine life.
Electronic References, Websites	https://utmsi.utexas.edu/academics/undergraduate/wh at-is-marine-biology https://www.marinebio.org/creatures/marine-biology/ https://link.springer.com/journal/227

Course Description of Fish Feed Manufacturing

1. Course Name:	
Fish Feed Manufacturing	
2. Course Code:	
001130	
3. Semester / Year:	
First semester / 2023 - 2024	
4. Description Preparation Date:	
7/ 2/ 2025	
5. Available Attendance Forms:	
Full time (theoretical lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours per week for 14 weeks	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Prof.S.M.Njim & Prof. A.Y. Al-Dubakel Email: aaldubakel22@gmail.com	
8. Course Objectives	
Course Objectives	- This course aims that when students successfully complete their studies, they will - have grasped the concepts and skills and are able to : - Inferring the importance of nutrition and the components of the diet. - The use of modern methods of processing and feeding fish. - Using different methods to evaluate fish diets. - Work in the field of fish farming and feeding, and they have theoretical and applied knowledge regarding the subject of the principles of fish nutrition. - Obtaining the skills required for postgraduate studies. - Submission of external examinations by local / regional / international bodies. - Giving information on the basic aspects of fish nutrition, especially in the field of fish farming. - Using modern methods of processing and feeding fish.

9. Teaching and Learning Strategies

Strategy	1) Theoretical lecture. 2) Practical and field application. 3) Readings and external sources. 4) Group discussions.
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10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject	Learning Method	Evaluation Method
1	5	Introduction and historical presentation of the development of feed manufacturing	The basics of fish feed manufacturing	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
2	5	Explanation and clarification of the importance of chemical composition and components of food	Chemical composition and food ingredients	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
3	5	Food classification: energy sources– protein sources other sources	Food classification	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
4	5	Explanation and clarification of the food ingredient used in feeding fish, their importance and their use.	Food ingredients used in feeding fish	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
5	5	Explain and clarify The different types of diets and their specifications	Types of diets	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
6	5	Explanation and clarification of the most important methods to diet formulation and how to calculate it	Methods of diet formulation	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
7	5	Explanation of the General characteristics of Devices for drying Mixing, grinding Cooling and packing	Machines and equipment used for the manufacture of	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
8	5	Familiarize students to the steps of diet manufacturing: mixing, Grinding and pelleting	Diet manufacturing methods	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
9	5	Familiarize students with the Methods of storing and handling the diets, the conditions and specificati ons for storing the diets	Diets storage methods	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports

10	5	A detailed explanation of the problems of using diets in fish feeding and their solution.	Problems of using diets in fish feeding	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
11	5	Explanation and clarification of methods for evaluating diets chemically , physically and biologicall	Diets evaluation	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
12	5	Explain and clarify The analysis of The component ts of chemical diets	Methods for analyzing the components of diets	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
13	5	Food additives: Binders Therapy- Nutrients- Hormones –Pigments Antioxidan Preservaties	Food additives	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports
14	5	Explain and clarify fish feeding tables and feeding methods and how to feed fish according to feeding tables and different feeding	Fish feeding tables and feeding methods	Theoretical and Practical lectures +Presentation methods+ dialogue and discussion	Daily, monthly and final exams and daily reports

11. Course Evaluation

- 1) Monthly written exams.
- 2) Monthly practical tests.
- 3) Daily quizzes.
- 4) Homework and reports.
- 5) The student's activity during the lecture and the extent of his commitment to attend.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	1) Fish Food and Feeding, by . T. I. Ahmed and N. A. Salman, 1982, 2) Fish Culture by N.K. Al-Daham, 1990
Main References (Sources)	1) Feed Management in Intensive Aquaculture. Goddard, (1996) 2) Aquafeed formulation. Sergio (2016)
Recommended Books and References (Scientific Journals, Reports...)	1) HANDBOOK ON INGREDIENTS FOR AQUACULTURE FEEDS . Hertrampf & Piedad-Pascual (2000) 2) FISH FEED FORMULATION METHOD. kumar (2020) 2) Feed and Feeding Practices in Aquaculture. Davis (2015)
Electronic References, Websites	1) http://aims.fao.org/news/faoinfoods-globalfood-composition-database-fish-and-shellfishdata-policy 2) https://www.sciencedirect.com/science/article/pii/S2590332219301320 3) http://www.fao.org/3/x5738e/x5738e00.htm

Course Description of Fish feeding principles

1. Course Name:	
Fish feeding principles	
2. Course Code:	
002120	
3. Semester / Year:	
Second semester / 2023 - 2024	
4. Description Preparation Date:	
7/ 2/ 2025	
5. Available Attendance Forms:	
Full time (theoretical lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours per week for 14 weeks	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Prof.S.M.Njim & Prof. A.Y. Al-Dubakel Email: aaldubakel22@gmail.com	
8. Course Objectives	
Course Objectives	- This course aims that when students successfully complete their studies, they will - have grasped the concepts and skills and are able to: - Work in the field of fish feed and farming and have theoretical and applied - Knowledge regarding the subject of the principles of fish nutrition. - Obtaining the required skills for postgraduate studies (postgraduate studies). - Submission of external examinations by local / regional / international organizations. - Giving information on the basic aspects of fish
9. Teaching and Learning Strategies	
Strategy	1) Theoretical lecture. 2) Practical and field application. 3) Readings and external sources. 4) Group discussions.

10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	General introduction to fish nutrition	Introduction	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
2	5	Explain and clarify the most important nutrients	Nutrients	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
3	5	Explain and clarify the importance of	Protein and amino acids	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
4	5	Explain and clarify the importance of fat	Fat and fatty acids	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
5	5	Explain the general characteristic and their	Carbohydrates	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
6	5	Introduce students to the types and divisions	Vitamins	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
7	5	Familiarize students with the types and divisions	Minerals	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
8	5	A detailed explanation of energy, its divisions and its	Energy	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
9	5	Explain and clarify the methods of	Digestion	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
10	5	Explanation and clarification of the metabolism in fish	Metabolism	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports

11	5	Introducing the types of natural food and its importance	Natural food	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
12	5	Introducing the types of artificial food and its	Artificial food	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
13	5	Familiarize students with ways to determine	Determine the amount of food	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports
14	5	Explanation and clarification of the methods of feeding fish to	Methods of feeding	Theoretical and practical lectures+ presentation methods+	Daily, monthly and final exams and daily reports

11. Course Evaluation

- 1) Daily exams.
- 2) Competition and discussion questions related to the study material.
- 3) Homework and quick and sudden exams.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	Fish Food and Feeding, by . T. I. Ahmed and N. A. Salman, 1982
Main References (Sources)	-1Fish Nutrition. Halver & Hardy (2002) -2Food Intake in Fish. Houlihan and Boujard & Jobling, (2001) 3- Nutrition of pond fishes. Hephher (1988)
Recommended Books and References (Scientific Journals, Reports...)	1) Nutrient Requirements and Feeding of Finfish for Aquaculture. WEBSTER & LIM (2002) 2) On-farm feeding and feed management in aquaculture. Hasan & New (2013) 3) Feed and Feeding Practices in Aquaculture. Davis (2015)
Electronic References, Websites	1) http://www.fao.org/3/y5022e/y5022e00.htm 2) http://ecoursesonline.iasri.res.in/course/view.php?id=426

Course Description of Marine Biology

1. Course Name:	
Marine Biology	
2. Course Code:	
002140	
3. Semester / Year:	
Second/ Fourth	
4. Description Preparation Date:	
10/ 1/ 2025	
5. Available Attendance Forms:	
Full time attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5/ 3.5	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Dr. Naeem Shanad Hammadi Email: naeem.hammadi@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	• • Graduating students capable of: • • Working in the field of environmental sciences, they have theoretical and applied knowledge regarding marine biology. • • Obtaining the skills required for the post-graduation plan (postgraduate studies). • • Applying for external tests by local/regional/international bodies. • • Thinking and analytical skills that enable one to achieve knowledge of diagnosing and classifying marine species and studying their distribution and relationship with the aquatic environment. • • Providing students with skills to work in scientific and research laboratories and study marine biology

9. Teaching and Learning Strategies

Strategy	- Enabling students to obtain knowledge and understanding of marine biology. - Enabling students to obtain knowledge and understanding of the relationship between marine organisms. - Enabling students to obtain knowledge and understanding of the methods used in collecting marine life samples - Enabling students to obtain knowledge and understanding of the methods used in classifying marine life types. - Introducing the student to laboratory work, applying theoretical information, and linking it to the reality of laboratory work. - Providing students with the basics and additional topics related to the previous learning outcomes of skills, to solve scientific problems. - Asking students during practical laboratories to diagnose and classify marine organisms. - Students' contribution by actually participating in the tests.
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10. Course Structure

Week	Hours	Required learning	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Introducing students to general information	A general introduction to marine biology.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
2	5	Introducing students to marine areas.	Major marine areas	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
3	5	Explain and clarify the environmental factors	Environmental factors affecting marine organisms.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
4	5	Introducing students to the division of marine	The division of marine organisms according to depth and the nature of	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
5	5	Explaining the general characteristics of the	The rocky tidal zone and its revival	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
6	5	Introducing students to the classification	Classification of marine organisms.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final

7	5	Introducing students to the group of algae.	The group of algae	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
8	5	A detailed explanation of the Phylum of	The Phylum of Mollusca	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
9	5	Introducing the importance of	Arthropods.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
10	5	Explanation and clarification of coral	Coral islands and their revival	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
11	5	Introduction to the group of sponges.	The group of sponges	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
12	5	A detailed explanation of the importance	Marine mammals.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
13	5	Introducing students to the importance	Marine fish resources.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
14	5	Explain and clarify the economic importance	The economic importance of marine wealth	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	-Introductory oceanography ninth. Ed. Harold r. Thurman & Elizabeth A. Burton Prentice Hall 2001
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Main References (Sources)	Biotores of the western Arabian Gulf. Marine & Eenviroments of Sudia Arabia Arabian American oil company 1977 A field guide to the sea shores of Kuwait - and the Arabian Gulf. - Wallace, R. L. and T. W. Snell 2001. Ecology and Classification of North American Freshwater Invertebrates, 2nd edition. (Thorpe, J. & Covich, eds.) Academic Press, NY.: 195-254.
Recommended Books and References (Scientific Journals, Reports...)	Research, university theses, and various taxonomic websites dealing with marine life.
Electronic References, Websites	https://utmsi.utexas.edu/academics/undergraduate/what-is-marine-biology https://www.marinebio.org/creatures/marine-biology/ https://link.springer.com/journal/227

Course Description of Environmental Pollution

1. Course Name:	
Environmental Pollution	
2. Course Code:	
FI 412	
3. Semester / Year:	
Second/ Fourth	
4. Description Preparation Date:	
10/ 1/ 2025	
5. Available Attendance Forms:	
Full time attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5/ 3.5	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Dr. Naeem Shanad Hammadi Email: naeem.hammadi@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	• • Identify the environment and its components that can be polluted due to various activities in daily life and their negative effects. • • Addressing the content of the environment in its three sections: air, soil, and water, and the various pollutants it suffers from. • • Causes of air pollution, climate change, ozone layer erosion, toxic and hazardous waste, environmental disasters and pollution, and reducing them. • • Soil pollution and how to reduce it in the field of environmental applications in the fish, pastures, forests and plains sectors. • • The causes of water pollution, while addressing the most important global environmental problems. • • Methods of combating and treating pollution that occurs in various environmental environments to reduce its harm.

9. Teaching and Learning Strategies

Strategy	1- Enabling students to obtain knowledge and understanding about environmental pollution. 2- Enabling students to obtain knowledge and understanding of the methods used in environmental pollution. 3- Enabling students to obtain knowledge and understanding of the methods used to achieve the concept of environmental pollution.
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10. Course Structure

Week	Hours	Required learning	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Introducing students to general information	A general introduction to the types of pollution and the most	Lectures Theoretical and practical + Display	the exams Daily and monthly And final
2	5	Introducing students to the main issues of pollution.	Explain the effect of air pollution on the layers of the atmosphere.	Lectures Theoretical and practical + Display	the exams Daily and monthly And final
3	5	The relationship between environmental factors and pollutants.	Explaining the chemical, biological and physical effects of some pollutants on aquatic organisms.	Lectures Theoretical and practical + Display methods + Dialogue and discussion	the exams Daily and monthly And final reports Daily
4	5	General introduction to radioactive contamination.	Explain the impact of radioactive pollution on the environment and aquatic life.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final reports
5	5	Introduction to methods of collecting water samples.	General details of water sample collection methods and device operation process.	Lectures Theoretical and practical + Display methods + Dialogue and	the exams Daily and monthly And final reports Daily

6	5	Introduction to methods for collecting aquatic animal samples.	General details of the method of collecting animal samples.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final reports
7	5	Definition of oil pollution and the different types of oil.	Explain the most common types of oils in the environment.	Lectures Theoretical and practical + Display	the exams Daily and monthly And final
8	5	A general introduction to the types of aromatic	Hazards of aromatic hydrocarbons from various media and	Lectures Theoretical and practical + Display	the exams Daily and monthly And final
9	5	Introduction to organic pollution.	Explain the negative impact of organic matter on the ecosystem.	Lectures Theoretical and practical + Display	the exams Daily and monthly And final
10	5	Definition of pesticide contamination and different	An explanation of the most common types of pesticides in the environment	Lectures Theoretical and practical + Display	the exams Daily and monthly And final
11	5	General introduction to pyrethroid pesticides.	Insecticide hazards of pyrethroids to various media and organisms.	Lectures Theoretical and practical + Display	the exams Daily and monthly And final
12	5	Introduction to flame retardants.	Explain the risks and effects of flame retardants in the environment.	Lectures Theoretical and practical + Display	the exams Daily and monthly And final
13	5	Introduction to pharmaceuticals and personal care products.	Explain the common types in the environment.	Lectures Theoretical and practical + Display	the exams Daily and monthly And final
14	5	General introduction to antibacterial compounds.	A general introduction to the negative role of this compound on the	Lectures Theoretical and practical + Display	the exams Daily and monthly And final

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	Pollution of the natural environment: Al-Siddiq Muhammad Al-Aqel, Muhammad Ayyad Muqilli, and Ali Abdel Karim Ali (1999). -Environmental studies and research: Environmental lectures on local and global issues, Friedrich Naumann Foundation and the National Program for Environmental Awareness and Media (1993). - Environment, environmental pollution, and ways to save humanity, Alexandria Book Center/Telfax 4846508 (2010).
Main References (Sources)	-Marine Environment and Pollution. Riad Halwagy; Divid Clayton and Manaf Behbehani, 1986. -Briggs, S. A. 1992. Basic guide to pesticides: their characteristics and hazards. Taylor & Francis. -Kuivila, K.A. Loftin, M.A. Mills, M.T. Meyer, J.L. Orlando, T.J. Reilly, K.L. Smalling, and D.L. Villeneuve. 2017 Expanded target-chemical analysis reveals extensive mixed-organic-contaminant exposure in U.S. streams. <i>Environmental Science and Technology</i> 51(9): 4792–480.
Recommended Books and References (Scientific Journals, Reports...)	-Chu, S., & Metcalfe, C. D. 2007. Simultaneous determination of triclocarban and triclosan in municipal biosolids by liquid chromatography tandem mass spectrometry. <i>Journal of Chromatography A</i>, 1164(1-2): 212-218. -Bhargava, H. N., & Leonard, P. A. 1996. Triclosan: applications and safety. <i>American journal of infection control</i>, 24(3): 209-218.
Electronic References, Websites	https://www.sciencedirect.com/journal/environmental-pollution https://www.sciencedirect.com/topics/earth-and-planetary-sciences/environmental-pollution https://education.nationalgeographic.org/resource/pollution/ https://www.studysmarter.co.uk/explanations/environmental-science/pollution/environmental-pollution/

Course Description of Plankton

1. Course Name:	
Plankton	
2. Course Code:	
001140	
3. Semester / Year:	
First/ fourth	
4. Description Preparation Date:	
10/10/ 2025	
5. Available Attendance Forms:	
Full time attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5/ 3.5	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Dr. Naeem Shanad Hammadi Email: naeem.hammadi@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	• • Graduating students capable of: • • Working in the field of environmental sciences, they have theoretical and applied knowledge regarding the subject of plankton science. • • Obtaining the skills required for the post-graduation plan (postgraduate studies). • • Applying for external tests by local/regional/international bodies. • • Thinking and analysis skills that enable one to achieve knowledge of diagnosing and classifying wandering species and studying their distribution, density and relationship to the aquatic environment. • • Providing students with skills to work in scientific and research laboratories and study plankton science and its relationship to fish resources.

9. Teaching and Learning Strategies

Strategy	Enabling students to obtain knowledge and understanding of the subject of plankton science. - Enabling students to obtain knowledge and understanding of the relationship of plankton and the food chain. - Enabling students to obtain knowledge and understanding of the methods used in collecting plankton samples. - Enabling students to obtain knowledge and understanding of the methods used in classifying plankton species. - Enabling students to obtain knowledge and understanding of how to use the taxonomic keys of plankton. - Introducing the student to laboratory work, applying theoretical information, and linking it to the reality of laboratory work
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10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Introducing students to general information about plankton science.	A general introduction to plankton science	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
2	5	Introducing students to phytoplankton and their main divisions.	Phytoplankton and their main divisions.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
3	5	Explain and clarify the environmental factors affecting phytoplankton.	Environmental factors affecting phytoplankton.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
4	5	Introducing students to the group of blue-green algae.	Blue-green algae group.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
5	5	Explain the general characteristics of the green algae group.	Green algae group.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
6	5	Introducing students to the group of diatoms.	group of diatoms.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
7	5	Explaining and clarifying primary productivity and its importance to the	Primary productivity and its importance to the aquatic	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
8	5	A detailed explanation of zooplankton and their main divisions.	Introduction to zooplankton and their main divisions.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final

9	5	Introducing the importance of the relationship between phytoplankton and	The relationship between phytoplankton and animals.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
10	5	Explanation and clarification of the group of Rotifera and Copepoda.	Set of Rotifera and Copepoda.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
11	5	Introduction to the groups of ciliates and Cladocera.	groups of ciliates and Cladocera.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
12	5	A detailed explanation of the importance of secondary	The importance of secondary productivity of zooplankton.	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
13	5	Introducing students to the relationship of zooplankton to environmental	The relationship of zooplankton to environmental	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final
14	5	Explain and illustrate the use of some types of zooplankton as	Using some types of zooplankton as environmental	Lectures Theoretical and practical + Display methods	the exams Daily and monthly And final

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	
Main References (Sources)	
Recommended Books and References (Scientific Journals, Reports...)	
Electronic References, Websites	

Course Description of Aquatic Plants

1. Course Name	
Aquatic plants	
2. Course Code	
001140	
3. Semester/Year	
First/Fourth	
Date of preparation of this description .4	
10/ 10/ 2025	
5. Available attendance forms	
My attendance is full time	
Number of credit hours (total) / number of units (total) .6	
3/ 2	
7. Course administrator's name (if more than one name is mentioned)	
Name: Dr. Adel Qasim Jassim Email: Adelkassim71@gmail.com	
8. Course Objectives	
- Identify aquatic plants and their importance..... - How to take advantage of aquatic	Course Objectives
9. Teaching and learning strategies	
1- Enable students to obtain knowledge and understanding of aquatic plants. 2- Enabling students to obtain knowledge and understanding of the means used in preserving plants . 3- Enabling students to obtain knowledge and understanding of the means used to cultivate aquatic plants.	Strategy

10. Course Structure

Evaluation method	Learning method	Unit or subject name	Required Learning Outcomes	Hours	Week
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Introduction to Water Batat	Introduce students to general information about aquatic plants	1	1
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	The importance of aquatic plants and their harms	Introduce students to the importance of aquatic plants and their harms	1	2
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Environmental factors affecting aquatic plants	Introduce students to environmental factors affecting aquatic plants	1	3
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Division of aquatic plants	Students know how to divide aquatic plants	1	4
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Succession of generations	You know the students by the succession of generations	1	5
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	The nature and appearance of aquatic plants	How does the student know the nature and appearance of aquatic plants	1	6
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	BThe appearance of aquatic plants	Introduce students to the external appearance	1	7
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Internal anatomy of leaf aquatic plants	Students know the internal anatomy of aquatic plants	1	8
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Internal anatomy of aquatic stem plants	Students know the internal anatomy of aquatic plants	1	9
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Reproduction of aquatic plants	The student knows the types of reproduction of aquatic plants	1	10
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Cultivation of aquatic plants	Teaching students to grow aquatic plants	1	11

auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Mangrove plants	A slice known as the mangrove plant	1	12
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Marine plants	Teach students about marine plants	1	13
auditions Daily & Monthly Final and Reports Daily	Lectures Theoretical + Views +Dialogue and discussion	Seaweed	Explanation of seaweed	1	14

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports ... Etc.

12. Learning and Teaching Resources

Aquatic plants and algae 1991 Doctor Abdul reda Akbar Alwan Dr.	Required textbooks (methodology, if any)
WETLAND PLANTS BIOLOGY AND ECOLOGY 2001	Key references (sources)
Aquatic and Wetland Plants of Northeastern North America 2000	Recommended supporting books and references (scientific journals, reports...)
Links related to aquatic plants	Electronic references, websites

Course Description of Aquatic Ecology

1. Course Name:	
Aquatic Ecology	
2. Course Code:	
0C1140	
3. Semester / Year:	
First/ Second	
4. Description Preparation Date:	
March 2025	
5. Available Attendance Forms:	
Attendance time	
6. Number of Credit Hours (Total) / Number of Units (Total):	
5/ 3.5	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Prof. Dr. Abdul-Razak M. Mohamed Email: abdulrazak.mohamed@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	- Understand the importance of the aquatic environment - the ecosystem – the water cycle in nature. - It deals with the physical properties of water (temperature- light - pressure- viscosity and density- electrical conduction - flotation- surface tension). - It deals with chemical properties of water (as a solvent - dissolved substances - oxygen - carbon dioxide - other dissolved substances). - Recognize the types of aquatic environments (fresh water environment – estuarine environment - marine environment).
9. Teaching and Learning Strategies	
Strategy	Introducing the basics and types of aquatic environments, their physical, chemical and biological characteristics, and how to preserve and manage their wealth.

10. Course Structure					
Week	Hours	Required learning outcomes	Unit or Subject	Learning Method	Evaluation Method
1	5	Familiarity with the principles and basics of Aquatic ecology.	1- Introduction - aquatic ecology – ecosystem – water cycle in nature.	- Theoretical lecture. - Practical lessons. - Reports on one of the topics related to the specialization. - Discussions in the classroom.	- Quarterly examinations, the first in the sixth week and the second in the thirteenth week. - Scientific reports. - Student activity in discussion during the lecture and throughout the semester. - End-of-semester examination.
2	5		2- Physical properties of water (temperature – light - pressure – viscosity and density- conductivity - flotation - surface tension).		
3	5		3- Chemical properties of water (as a solvent – dissolved substances - oxygen - carbon dioxide- dissolved substances other).		
4	5		4- Freshwater environment.		
5	5		5- Estuarine environment.		
6	5		6- Marine environment.		
7	5		7- Fish environment: abiotic factors (temperature light- salinity – movement of water - substances		
8	5				
9	5				
10	5				
11	5				
12	5				
13	5				

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

- 25 marks for the monthly theory examination.
- 5 marks for the student's activity in discussion during the lecture.
- 15 marks for the practical examination.
- 5 marks for the report.
- 50 marks for the semester examination.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	- Al-Saady, <i>et al.</i> (1984). Aquatic Ecology. Basrah University, Iraq. - Al-Saady, H. 2010. Aquatic Ecology. Jordan. - Limiting factors & Tolerance laws
Main References (Sources)	- Barnes, R. S. K. and K. H. Mann (2009). Fundamentals of Aquatic Ecology, 2nd Ed. - Ecological Development & Succession
Recommended Books and References (Scientific Journals, Reports...)	- Southwick C.H. 1984. Ecology and the quality of our environment. Translated by Saleh <i>et al.</i> 1984. (In Arabic). - Ecological stratification & zonation
Electronic References, Websites	- Biogeochemical Cycles

Course Description of invertebrates

1. Course Name:					
The invertebrates					
2. Course Code:					
002130					
3. Semester / Year:					
Second/ Third					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
Attendance time					
6. Number of Credit Hours (Total) / Number of Units (Total)					
5/ 3.5					
7. Course Administrator's Name (Mention All, If More Than One Name)					
Name: Asist. Prof. Dr. Thamir K. Adday Email: thamiradday@gmail.com					
8. Course Objectives					
Course Objectives		- Students learn about different groups of invertebrate.. - Distribution of invertebrates in the marine and freshwater environments. - Identify the benefits and harms of some invertebrates			
9. Teaching and Learning Strategies					
Strategy		Theoretical lecture. Reports on various topics related to the specialty. Discussions in the classroom.			
10. Course Structure					
Week	Hours	Required learning outcomes	Unit or Subject	Learning Method	Evaluation Method

First	2	Benifits and harms of			
Second	2	invertebrates			
Third	2	The Protozoa			
Fourth	2	The Cnidaria			
Fifth	2	Porifera (Sponges)			
Sixth	2	Platyhelminthes			
Seventh	2	Nematoda			
Eight	2	Annelida			
Ninth	2	Arthropoda I			
Tenth	2	Arthropoda II			
Eleventh	2	Mollusca			
Twelfth	2	Echinodermata			

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

20marks for each monthly exam

5 marks Student discussion activity during the lecture

5 marks for the report submitted by the student

50 marks grade at the end of the semester

The total score is 100

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	
Main References (Sources)	The Invertebrates An Introduction to the Invertebrates
Recommended Books and References (Scientific Journals, Reports...)	Marine Invertebrates: Communities at Risk
Electronic References, Websites	https://guides.lib.ua.edu/invertebrate_zoology

Course Description of Fish Breeding Techniques

1. Course Name:	
Fish Breeding Techniques	
2. Course Code:	
002140	
3. Semester / Year: Semester:	
Second/ Fourth	
4. Description Preparation Date: 4/2/2024	
10/2/2025	
5. Available Attendance Forms:	
Full time attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5/ 3.5	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: D. Ahmed Muhsen Mojer Email: ahmedmojer@ubasrah.edu.com Prof. Asst. Rajaa Abid Ali	
8. Course Objectives	
Course Objectives	- Identify the concept of artificial propagation. Practicing the crossbreeding between fish - Conducting taxation operations between different species of fish - Identify the reproductive characteristics of fish species - Identify the stages of development of gametes and fish embryos
9. Teaching and Learning Strategies	
Strategy	Knowledge understanding and developing students mental applied and general skills
10. Course Structure	

Week	Hours	Required learning	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Introducing students to information about fish breeding and	General Introduction	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to
2	2	Introducing students to the effect of internal factors and hormones	Factors affecting the creation and development of gametogenesis	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to
3	2	Introducing students to the requirements of raising and caring for Brooder prepared for	Fish biology of locally fish which used in reproduction	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to presentation
4	2	Introducing students to how to care for and feed brood	Management of brooder fish	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning
5	2	Introducing students to the advantages and disadvantages of internal education and hybridization between closely	Inbreeding and negative impact on Iraqi brood stock	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to presentation
6	2	Introducing students to the methods used to feed brood fish and how to manage ponds	The method of breeding and feeding brooder fish	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to presentation
7	2		Examination		
8	2	Introducing students to the basics and requirements of navigable natural	Fish multiplication in a wave multiplication methods	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to presentation

9	2	Introducing students to the components of the typical hatchery for	Artificial breeding - typical fish hatchery components	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to
10	2	Introducing students to how to perform artificial fish	Artificial propagation steps	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning
11	2	Introduce students to the basic requirements for breeding and caring for	Larvae Culture	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to presentation
12	2	Introducing the most important types of local fish that can be multiplied with an indication of the requirements for how to conduct the	Artificial breeding of local Iraqi fish – Cyprinidae	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to presentation
13	2	Introducing students to the most important types of marine fish that can be multiplied locally and the breeding methods used	Breeding marine fish from the Mugillidae and Sparinidae families	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to presentation
14	2	Introducing students to the important basics in how to manage fish hatcheries	Hatcheries Management	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to presentation
15	2	Introducing some fish breeding techniques, the most prominent hormones used for multiplication, and how to	Complementary Technics	Presentation, discussion and dialogue	Semester Exam, Daily Participation, Assigning students to presentation

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

- 1- 20% for the semester exam
- 2- 20% for presentations
- 3- 10% for the student's effectiveness in participating in the lecture

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	----
Main References (Sources)	Fish Reproduction biology
Recommended Books and References (Scientific Journals, Reports...)	Methods in Reproductive Aquaculture Mass Production Eggs And Early Fry
Electronic References, Websites	Publications of the World Food Organization (FAO)

Course Description of Fish genetic engineering

1. Course Name:	
Fish genetic engineering	
2. Course Code:	
002130	
3. Semester / Year:	
Second/ Third	
4. Description Preparation Date:	
12 /2/ 2025	
5. Available Attendance Forms:	
Full time (theoretical lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5/ 3.5	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Rajaa abdali	Email:abdalirajaa@yahoo.com
8. Course Objectives	
Course Objectives Graduating students who are able to:	• Working in the field of environmental sciences, they have theoretical and applied knowledge of the subject of genetic • Obtaining the skills required for a postgraduate plan (postgraduate studies). • Thinking and analysis skills that enable access to knowledge of Genetic in fish.
9. Teaching and Learning Strategies	
Strategy	Students will learn how to perform geneic applications on fish

10. Course Structure

Week	Hours	Required learning	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Identify genetic traits	Definition of genetics	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
2	5	Knowledge of genetic foundations	Basics of genetics	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
3	5	Learn about the law	Mendels law	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
4	5	Blood types	Inheritance of blood groups	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
5	5	Applications	Genetic Engineering	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
6	5	Concepts of procreation	Quantitative genetic	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
7	5	Inheritance of traits	Genetic Mutations	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
8	5	Improve quality	Election	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
9	5	Reproduction methods	Biotechnology	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
10	5	Increase in production	Basics of genetics in fish	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

11	5	Gathering of aquatic organisms	Characterized reproduction in aquatic organisms	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.					
12. Learning and Teaching Sources					
Required Textbooks (Curricular Books, If Any)			Basics of genetics Genetics and biotechnology in fish		
Main References (Sources)			Lectures on genetics		
Recommended Books and References (Scientific Journals, Reports...)					
Electronic References, Websites			Making presentations		

Course Description of Fish diseases and parasites

1. Course Name:	
Fish diseases and parasites	
2. Course Code:	
001140	
3. Semester / Year:	
Second/ Fourth	
4. Description Preparation Date:	
15/9/2025	
5. Available Attendance Forms:	
Full time (theory lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours weekly for 14 weeks	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Khalidah Salim Khaudeyer	Email: khalidah_salim@yahoo.com
8. Course Objectives	
Course Objectives	- Obtaining the skills required for the post-graduation plan (postgraduate studies). - Submitting to external tests by local/regional/international bodies. - Graduating students who are able to - Diagnosing fish infections and the best methods for prevention and treatment. - Thinking and analysis skills that enable one to reach knowledge of diagnosis and classification of the types of parasites that harm fish farms in particular. - Providing students with the skills to work in scientific and research laboratories and study pathology and its relationship to fish wealth.

9. Teaching and Learning Strategies

Strategy	1. Enabling students to think and analyze topics related to the intellectual framework of fish diseases and parasites. 2- Enable students to think and analyze topics related to diagnosing fish diseases. 3- Enable students to think about how to collect infected fish samples. 4- Enabling students to think and analyze to identify the most correct methods for managing fish health.
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10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
2	5	Familiarizing students with general information about fish diseases and parasites.	General introduction (animal relations; parasite and disease, zoonoses; enemies of fish).	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
2	5	Introducing students to the adaptations of parasites.	Parasitism and parasitism (effect of the parasite on the host; host reaction; types of parasites and types of hosts). Parasitic adaptations (adaptations for fixation and nutrition; adaptations for reduction and loss of organs; physiological adaptations; reproductive adaptations; life cycle conformity; protection adaptations during transmission).	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

3	5	Explaining and clarifying the life cycles of fish parasites and the symptoms of fish infection.	Life cycles of parasites (importance of studying the life cycle; classification of life cycles; examples of life cycles of parasites) - Symptoms of fish infection (fish behaviour; fish colour; fish appearance; symptoms of skin, eyes, gills, fins and body openings).	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
4	5	Introducing students to a group of the most important and common fish diseases.	Viral and bacterial diseases.	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
5	5	Exam		Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
6	5	Introducing students to another group of fish diseases.	Fungal diseases	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

7	5	An explanation of the most important primary animals that infect fish.	Primary animals parasitizing on fish.	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
8	5	An explanation of the most important flatworms that infect fish, especially farmed fish.	Flatworms parasitic in fish.	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
9	5	Introduction to nematodes and spiny-headed worms parasitic on farmed fish.	Nematodes - parasitic Acanthocephalic worms in fish.	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
10	5	Exam		Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
11	5	Introduction to the group of leeches, crustaceans, and oyster larvae that parasitize fish.	Leeches, crustaceans, and oyster larvae parasitizing fish	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports

12	5	A detailed explanation of environmental diseases and nutritional deficiency diseases that occur in fish.	Environmental diseases and nutritional deficiency diseases in fish.	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
13	5	Introducing students to genetic diseases that occur in fish.	Genetic diseases in fish.	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
14	5	Revision	General Review.	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	
Main References (Sources)	- Fish diseases by Noga, 2010 -Behrmann-Godel, J. (2015). Disease Agents and Parasites of Carp. In book: Biology and Ecology of Carp. - Molnár, K., Székely, C. and Láng, M. (2019). Field guide to the control of warmwater fish diseases in Central and Eastern Europe, the Caucasus and Central Asia. FAO Fisheries and Aquaculture

Recommended Books and References (Scientific Journals, Reports...)	Fish illnesses How to spot them https://www.tetra-fish.com/learning-center/troubleshooting/fish-illnesses-how-to-spot-them.aspx
Electronic References, Websites	- https://www.fsai.ie/faq/fish_parasites.html - https://vfa.vic.gov.au/operational-policy/pests-and-diseases/some-parasites-of-freshwater-fish - https://www.usgs.gov/ecosystems/fish-wildlife-disease/diseases-aquatic-organisms/parasitic-diseases-wild-fish?qt-science_support_page_related_con=0#qt-science_support_page_related_con

Course Description of Zoology

1. Course Name:	
Zoology	
2. Course Code:	
002110	
3. Semester / Year:	
Second semester	
4. Description Preparation Date:	
15/9/2025	
5. Available Attendance Forms:	
Full time (theory lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours weekly for 14 weeks	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Khalidah Salim Khaudeyer	Email: khalidah_salim@yahoo.com
8. Course Objectives	
Course Objectives	- Knowledge of the basic principles of animal science. - Clarifying the interventions that may occur in cells. - Knowledge of testing mechanics and how to deal with models of various types. - Know the clinical importance and benefit of performing laboratory tests. - Knowledge of interpretation of results and how to write test results reports.
9. Teaching and Learning Strategies	

Strategy	• Provide the student with sufficient information to give him experience in dealing with life sciences. • Gain experience in knowing the cell structure in all eukaryotes. • Giving him sufficient information to keep up with and study modern science. And develop knowledge about the cell and its basic components. • Improving the level of comprehension and developing the ability to interpret, predict, and deduce (understanding). • Development of applied capabilities. • Providing the student with the ability to analyze. Developing the student's ability to integrate ideas and information at the synthesis level, which is the opposite of analysis. Developing the student's ability to make a judgment on the value of the learned material (evaluation).
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10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
2	5	Introduction of Biology	Light Microscope	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
2	5	Characteristic of living organism	Animal Cell Wall	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
3	5	Structure and function of Cell	Animal tissue	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

4	5	Structure and function of Cell	Connective Tissue	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
5	5	Respiration and glycolysis	Epithelial Cell	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
6	5	Cell energy	Muscular Tissue	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
7	5	Respiration and glycolysis	Exam	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
8	5	Oxidative phosphorylation cycle	Flat worms	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports

9	5	Animal nutrition	Filamentous Worms	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
10	5	Animal circulation	Arthropoda	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
11	5	Neurons	Evolution	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
12	5	Cell Energy	Endocrine system	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
13	5	Animal hormones	Sedimentation co efficient	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports

14	5	Animal hormones	Animal Kingdom	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
11. Course Evaluation					
Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.					
12. Learning and Teaching Sources					
Required Textbooks (Curricular Books, If Any)					
Main References (Sources)			Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter (2010) Essential Cell Biology 3th ed, Garland Science, NY, USA.		
Recommended Books and References (Scientific Journals, Reports...)			MBV Roberts (1982). Biology: A functional approach. 2th edition. Wlton.thmoas. NewYork, USA.		
Electronic References, Websites			https://books-library.website/Reference-Search-Branches-of-Zoology		

Course Description of Fish stocks program

1. Course Name :	
Fish stocks program	
2. Course Code:	
002130	
3. Semester/Year	
Second/ Third	
: Date of preparation of this description .4	
2025	
5. Available attendance forms :	
Attendance at the college / (theoretical lecture and practical lecture)	
6. Number of credit hours (total) / number of units (total):	
5 hours / 3.5 units	
7. Course administrator's name (if more than one name is mentioned)	
Name: Prof. Amjad Kazem Rasan Email: amjed.rasen@uobasrah.edu.iq	
8. Course Objectives	
:Graduating students who are able to Work in the field of environmental sciences - have theoretical and applied knowledge regarding .fish stock material Obtain the skills required for the post- - .graduate plan (postgraduate studies) Submission of external exams by - .local/regional/international bodies Thinking and analysis skills that enable - access to knowledge of methods of estimating fish stocks - Providing students with work skills in analyzing fishing data, especially modern software for fish stocks .	Course Objectives

9. Teaching and learning strategies

- Provide students with the basics and additional topics related to the pre-skills learning outcomes, to solve scientific problems.
- Asking students during practical lessons to learn the skills of using modern software in estimating fish stocks.
- Students' contribution by actually participating in the tests.

Strategy

10. Course Structure

Evaluation method	Learning method	Unit or subject name	Required Learning	Hours	Week
auditions Daily & Monthly Final and Reports Daily	Lectures	Fish stocks	Introduction – The concept of community dynamics – the concept of fish stocks	5	:Week 1
auditions Daily & Monthly Final and Reports Daily	Lectures	data collection	Data collection and analysis	5	:Week 2
auditions Daily & Monthly Final and Reports Daily	Lectures	Overexploited and unexploited inventory	Know the concept of exploited and unused inventory	5	:Week 3
auditions Daily & Monthly Final and Reports Daily	Lectures	Growth of fish populations	Introducing students to the concept of growth of fish groups	5	:Week 4
auditions Daily & Monthly Final and Reports Daily	Lectures	Fish stocks	Methods of estimating fish stocks	5	:Week 5
auditions Daily & Monthly Final and Reports Daily	Lectures	Utilization rate	Methods for estimating the rate of fish exploitation	5	:Week 6
auditions Daily & Monthly Final and Reports Daily	Lectures	Fish mortality	Introducing students to fish mortality and methods of estimating them	5	:Week 7
auditions Daily & Monthly Final and Reports Daily	Lectures	Fishing	Optional fishing methods	5	:Week 8
auditions Daily & Monthly Final and Reports Daily	Lectures	Fisheries	Introducing the importance of fisheries	5	:Week 9
auditions Daily & Monthly Final and Reports Daily	Lectures	Software	Explanation and clarification of the software used in estimating fish stocks	5	:Week 10

auditions Daily & Monthly Final and Reports Daily	Lectures	Fish stocks	Tracking and monitoring fish stocks	5	:Week 11
auditions Daily & Monthly Final and Reports Daily	Lectures	Supply	Detailed explanation of the importance of supply	5	:Week 12
auditions Daily & Monthly Final and Reports Daily	Lectures	History	A historical overview The most important scientists who laid the foundations of fish	5	:Week 13
auditions Daily & Monthly Final and Reports Daily	Lectures	Practical applications	Strengthening students' skills on practical computer applications on fish stock	5	:Week 14

11. Course Evaluation

- Daily exams with multiple-choice questions that require scientific skills.
- Daily exams with scientific questions.
- Participation grades for competition questions for academic subjects.
- Grade homework and reports
- Grades of the student's activity during the lecture and the extent of his commitment to attendance and non-absence.

12. Learning and Teaching Resources

The Dynamics of Fish Populations (2014). Prof. Abdul Razzaq Mahmoud	Required textbooks (methodology, if any)
• Ricker, W. E. (1971). Methods for assessment of fish production in freshwater. IBI Handbook No. 3. 2nd ed. Blackwell • Ricker, Publications Orchard and Eisure 45P. • method of population analysis. J. Fish. Res. Board Can. 25:1666-1672. • Ricker, W. E. (1975). Computation and interpretation of biological statistics of fish population. Bull. Fish. Res. Bd. • Rikhter, V. A 2nd V. N. Efanov (1976). On one of the approaches to estimation of natural mortality of fish • Populations. ICNAF Res. Doc., 76/VI/8: 12 pP.	Key references (sources)
-	Recommended supporting books and references (scientific journals, reports...)
.Websites and video tutorials	Electronic references, websites

Course Description of Aquatic physiology

1. Course Name:	
Aquatic physiology	
2. Course Code:	
001130	
3. Semester / Year:	
First/ Third	
4. Description Preparation Date:	
15/9/2025	
5. Available Attendance Forms:	
Full time (theory lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours weekly for 14 weeks	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Fatima Abdul hussian Mohammed Email: fatimamantather49@gmail.com	
8. Course Objectives	
Course Objectives	Graduating students who are able to: -Working in the field of environmental sciences, they have theoretical and applied knowledge of the subject of plankton science. -Obtaining the skills required for a postgraduate plan (postgraduate studies). -Submission of external examinations by local / regional / international bodies. -Thinking and analysis skills that enable access to knowledge of aquatic physiology and relationship to the aquatic environment. -Providing students with the skills to work in scientific and research laboratories and study the science of aquatic physiology and its relationship to fisheries.
9. Teaching and Learning Strategies	

Strategy	-Providing students with the basics and additional topics related to previous learning outcomes for skills, to solve scientific problems. - Asking students through practical laboratories to perform experiments concerning aquatic physiology. Students' participation in the actual examinations.
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10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	5	Introduce students to general information about the science of aquatic physiology.	General introduction to the science of aquatic physiology.	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
2	5	Introduce students to the internal and external anatomy of fish and aquatic organisms.	Internal and external anatomy of fish and aquatic organisms .	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
3	5	Explanation and clarification of musculature and nervous system in fish.	Musculature and nervous system in fish .	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
4	5	Introduce students to cell membrane and transportation..	Cell membrane and transportation.	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
5	5	Explanation of the osmotic regulation in fish.	Osmotic regulation in fish .	Theoretical and practical lectures + presentation methods +	Daily, monthly and final exams and daily reports

				dialogue and discussion	
6	5	Introduce students to the circulatory system and hematology of fish and shrimp.	Circulatory system and hematology of fish and shrimp.	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
7	5	Explanation and clarification of respiratory system and branchial circulation.	Respiratory system and branchial circulation..	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
8	5	Detailed explanation of digestive system and absorption.	Digestive system and absorption.	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
9	5	Defining the importance of sense organs in aquatic organisms.	Sense organs in aquatic organisms .	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
10	5	Explanation and clarification of endocrine system in fish.	Endocrine system in fish	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
11	5	Definition of urinary and reproductive system in fish.	Urinary and reproductive system in fish.	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
12	5	Detailed explanation reproduction strategies in fish.	Reproduction strategies in fish .	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
13	5	Introduce students to migration behavior in fish.	Migration behavior in fish .	Theoretical and practical lectures + presentation methods + dialogue and	Daily, monthly and final exams and daily reports

				discussion	
14	5				Daily, monthly and final exams and daily reports

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

1. Books Required reading:	None.
2. Main references (sources)	- Introduction to Fish Physiology,1,2,3
A- Recommended books and references (scientific journals, reports...).	Various research papers and university theses on aquatic physiology
B-Electronic references, Internet sites...	Major websites on fisheries sciences

Course Description of Laboratory techniques

1. Course Name:	
Laboratory techniques	
2. Course Code:	
002140	
3. Semester / Year:	
Second semester	
4. Description Preparation Date:	
15/9/2025	
5. Available Attendance Forms:	
Full time (theory lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5/ 3.5	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Dr. Habeeb Mohsin Alsudani Email: habeebalsudani@yahoo.com	
8. Course Objectives	
Course Objectives	- Knowledge of the basics of microscopic preparations. - Different types of microscopic preparation methods. - Knowing how to deal with conclusions of all kinds. - Periods of scientific research that require complete knowledge of microscopic preparations. • How to read the final results and classify them as the end results of scientific research.
9. Teaching and Learning Strategies	

Strategy	• Providing the student with sufficient information to gain experience in microscopic preparations. • Gain experience in dealing with different biological samples. • Providing him with sufficient information to keep up with and study modern science. Developing knowledge about the cell and its basic components. • Improving the level of comprehension and developing the ability to interpret, predict and conclude (understanding). • Develop applied capabilities. • Giving the student the ability to analyze. • Developing the student's ability to integrate ideas and information at the level of synthesis, which is the opposite of analysis. Developing the student's ability to make a judgment on the value of the material learned (evaluation).
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10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Learn about the concept of microscopic preparations	Introduction of preparation science	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
2	5	Identify the types of microscopes and their uses	Types of microscopes	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

3	5	Identify the types of fixation and their areas of use	Fixatives	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
4	5	Identifying the reason of dehydrate and the areas of identifying methods for takeoff water from samples and the benefits of them	Dehydration	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
5	5	Replacing the dehydrating fluid with a fluid that is totally miscible with both the dehydrating fluid	Clearing	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
6	5	Replacing the clearing agent	Infiltration	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
7	5		Exam	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports

8	5	The infiltrated tissue	Embedding	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
9	5	The resulting block is trimmed to expose the tissue	Trimming	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
10	5	slicing using microtome	Sectioning	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
11	5	the tissue sections on the adhesive coated glass slides	Mounting	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
12	5	stain is a chemical substance	Staining:	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports

13	5	Learn how to read images and write results	Microscopic examination	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
14	5	The ability to identify errors and defects that may occur	Full review	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	Microscopic preparations
Main References (Sources)	Light Microscopy_ Methods and Protocols
Recommended Books and References (Scientific Journals, Reports...)	Histopathology Specimens_ Clinical, Pathological and Laboratory Aspects
Electronic References, Websites	https://books-library.website/Reference-Search

Course Description of Aquatic plants

1. Course Name:	
Aquatic plants	
2. Course Code:	
001140	
3. Semester / Year:	
First/ Fourth	
4. Description Preparation Date:	
3/3/2025	
5. Available Attendance Forms:	
Full time (theory lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
4/ 2.5	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Adel kassim Jassim Email: adelkassim71@gmail.com	
8. Course Objectives	
Course Objectives	•Identifying aquatic plants and their importance..... •How to benefit from aquatic plants • Cultivation of aquatic plants ...
9. Teaching and Learning Strategies	
Strategy	1 -How can students gain knowledge and understanding of aquatic plants. 2 -How can students obtain knowledge and understanding of the methods used in preserving plants? 3- How can students obtain knowledge and understanding of the methods used to grow aquatic plants?

10. Course Structure					
Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Introducing students to general information about aquatic plants	Introduction to aquatic plants	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
2	4	Introducing students to the importance of aquatic plants and their harms	The importance of aquatic plants and their harms	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
3	4	Students are introduced to the environmental factors affecting aquatic plants	Environmental factors affecting aquatic plants	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
4	4	Students know how to divide aquatic plants	divide aquatic plants	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports

5	4	Students are introduced to the succession of generations	Succession of aquatic plants	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
6	4	How does the student learn about the nature and appearance of aquatic plants?	The nature and appearance of aquatic plants	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
7	4	Students become familiar with their external appearance	Morphology of aquatic plants	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
8	4	Students know the internal anatomy of aquatic plants	Internal anatomy of leaf aquatic plants	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
9	4	Students know the internal anatomy of aquatic plants	Internal anatomy of stem aquatic plants	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

10	4	The student knows the types of reproduction of aquatic plants	Reproduction of aquatic plants	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
11	4	Teaching students to grow aquatic plants	Cultivation of aquatic plants	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
12	4	Definition of mangrove plant	Mangrove plants	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
13	4	Students learn about marine plants	Marine plants	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
14	4	Explanation of seaweeds	Seaweed	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	Aquatic plants and algae 1991 Dr.. Abdul Redha Akbar Alwan Dr.
Main References (Sources)	WETLAND PLANTS BIOLOGY AND ECOLOGY 2001
Recommended Books and References (Scientific Journals, Reports...)	Aquatic and Wetland Plants of Northeastern North Aillerica2000
Electronic References, Websites	Links related to AQUATIC PLANTS

Course Description of Marsh and wetland environment

1. Course Name:	
Marsh and wetland environment	
2. Course Code:	
001130	
3. Semester / Year:	
First/ Third	
4. Description Preparation Date:	
3/3/2025	
5. Available Attendance Forms:	
Full time (theory lecture/practical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours weekly for 14 weeks	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Adel kassim Jassim Email: adelkassim71@gmail.com	
8. Course Objectives	
Course Objectives	.Learn about the importance of marshes and wetlands and their importance..... •How to benefit from the marshes • The most important risks to which the marshes
9. Teaching and Learning Strategies	

Strategy	1-How can students gain knowledge and understanding of wetlands. 2- How can students obtain knowledge and understanding of the methods used in preserving wetlands? 3- How can students obtain knowledge and understanding of the methods used to identify and preserve biodiversity in the Iraqi marshes?
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10. Course Structure

Week	Hours	Required learning	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Introducing students to general information about wetlands	Introduction to wetlands	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
2	5	Students are introduced to the classification of marshes	Marsh classification	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
3	5	Students learned about schools that classify types of wetlands	Types of wetlands	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports

4	5	Introducing students to the hydrology of wetlands	Hydrology of wetlands	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
5	5	Introduces students to the environmental factors of wetlands	Environmental factors of wetlands	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
6	5	Students know the types of wetland plants	Wetland plants	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
7	5	Introduces students to the primary productivity of wetlands	Wetland productivity	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
8	5	Students know the division of the Iraqi marshes	Iraqi marshes	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

9	5	Students learn about the emergence of the Iraqi marshes	The emergence of the Iraqi marshes	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
10	5	The student is introduced to the biodiversity of the Iraqi marshes	Biodiversity in the Iraqi marshes	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
11	5	Teaching students about endangered species in the marshes	Endangered species in the marshes	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
12	5	Teaching students about the International Convention for the Conservation of Marshlands	International Convention for the Conservation of Marshlands	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
13	5	Students learn about the environmental changes that occur in the marshes	Environmental changes occurring in the marshes	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

14	5	How to preserve marshes	Preserving the marshes	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
11. Course Evaluation					
Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.					
12. Learning and Teaching Sources					
Required Textbooks (Curricular Books, If Any)					
Main References (Sources)			Environment of the Iraqi Marshlands, Najah Abboud 2014		
Recommended Books and References (Scientific Journals, Reports...)			WETLAND PLANTS BIOLOGY AND ECOLOGY JULIE K. CRONK M. SIOBHAN FENNESSY 2001		
Electronic References, Websites			Links related to WETLAND AND MARSHES		

Course Description of Extension and agricultural techniques

1. Course Name:	
Extension and agricultural techniques	
2. Course Code:	
0C2130	
3. Semester / Year:	
Second/ Third	
4. Description Preparation Date:	
15/9/2025	
5. Available Attendance Forms:	
Full Attendance time (theory lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours weekly for 14 weeks	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Dr. Habeeb Mohsin Alsudani Email: habeebalsudani@yahoo.com	
8. Course Objectives	
Course Objectives	- Knowledge of the basic principles of Agricultural extension. - Explaining the different types of Agricultural extension methods. - Knowing how to deal with targeted individuals. - Areas of scientific research that require full knowledge of agricultural extension fields. - Determine the scope and areas of the extension program and whether it includes trying to raise the production efficiency of a particular crop or spreading industries.
9. Teaching and Learning Strategies	

Strategy	• Providing the student with sufficient information to gain experience in Agricultural extension. • Gain experience in dealing with different community samples. • Providing him with sufficient information to keep up with and study modern science. And developing knowledge. • Improving the level of comprehension and developing the ability to interpret, predict and conclude (understanding). • Develop applied capabilities. • Giving the student the ability to analyze. • Developing the student's ability to integrate ideas and information at the level of synthesis, which is the opposite of analysis. Developing the student's ability to make a judgment on the value of the material learned (evaluation).
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10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Learn about the mentoring program	Guidance program	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
2	2	Identify the types of microscopes and their uses	Determine the audience to whom the guidance program is directed	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

3	2	Identify the types of fixation and their areas of use	The principles that guide us when planning and developing extension programs	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
4	2	Identifying the reason of dehydrate and the areas of identifying methods for takeoff water from samples and the benefits of them	Several models to study the different steps involved in the process of developing guidance programs	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
5	2	Replacing the dehydrating fluid with a fluid that is totally miscible with both the dehydrating fluid	Identify the advantages and disadvantages of individual counseling methods	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
6	2	Replacing the clearing agent	It is commonly used in communicating with agricultural groups	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
7	2		Define the experience and its dependency	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

8	2	The infiltrated tissue	A method that attempts to convince farmers of the most appropriate improved methods	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
9	2	The resulting block is trimmed to expose the tissue	Agricultural extension meetings vary according to several considerations	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
10	2	slicing using microtome	Benefiting from the efforts of young people in calling for these meetings	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
11	2	the tissue sections on the adhesive coated glass slides	Diversify the methods or forms of meeting	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports
12	2	stain is a chemical substance	How to organize a successful annual field day	Lectures, Theoretical and practical + Display methods +Dialogue and discussion	Daily, monthly and final tests and daily reports

13	2	Learn how to read images and write results	Advantages of educational trips and visits	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports
14	2	The ability to identify errors and defects that may occur	Audio radio	Lectures, Theoretical and practical + Display methods + Dialogue and discussion	Daily, monthly and final tests and daily reports

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	
Main References (Sources)	مرجع الإرشاد الزراعي ، دكتور محمد محمد عمر الطنوبدار النهضة العربية للطباعة والنشر ، بيروت
Recommended Books and References (Scientific Journals, Reports...)	مجلة الجمعية العلمية للإرشاد الزراعي
Electronic References, Websites	https://mgiz.journals.ekb.eg/

Course Description of Design and Analysis of Agricultural Experiments

1. Course Name:					
Design and Analysis of Agricultural Experiments					
2. Course Code:					
0C1130					
3. Semester / Year:					
First/ Third					
4. Description Preparation Date:					
2025					
5. Available Attendance Forms:					
Attendance full time					
6. Number of Credit Hours (Total) / Number of Units (Total)					
5/ 3.5					
7. Course Administrator's Name (Mention All, If More Than One Name)					
Name: Prof. Dr. Riyadh A. Al-Tameemi Email: riyadh.irmayla@uobasrah.edu.iq					
8. Course Objectives					
Course Objectives			- Teaching students how to design agricultural experiments - Teaching students methods for analyzing agricultural experiments - Teaching students ways to understand the results of analysis		
9. Teaching and Learning Strategies					
Strategy		Weekly lectures include an explanation of the theoretical basis of variance analysis and its practical application, homework assignments, and printed and video lectures to be accessible to students at any time.			
10. Course Structure					
Week	Hours	Required learning	Unit or Subject Name	Learning Method	Evaluation Method

First	Two Theoretical + Three Practical	Learn about the general concepts of design	The introduction General concepts	Explanation of the topic with practical application	Quiz
Second	Two Theoretical + Three Practical	Identify hypotheses and ways to test them	Analysis of variance and hypothesis testing	Explanation of the topic with practical	Quiz
Third	Two Theoretical + Three Practical	Learn about the completely randomized design and how to use it	Completely randomized design	Explanation of the topic with practical application	Quiz
Fourth	Two Theoretical + Three Practical	Identify independent comparisons to compare means	Independent comparisons 1	Explanation of the topic with practical	Quiz
Fifth	Exam				
Sixth	Two Theoretical + Three Practical	Identify independent comparisons to compare means	Independent comparisons 2	Explanation of the topic with practical application	Quiz
Seventh	Two Theoretical + Three Practical	Learn about the completely randomized block design and how to use it	Randomized complete block design	Explanation of the topic with practical application	Quiz
Eighth	Two Theoretical + Three Practical	Learn about the method of estimating the missing value and the relative efficiency of the design	Missing values and relative efficiency	Explanation of the topic with practical application	Quiz
Ninth	Two Theoretical + Three Practical	Learn about the design of the Latin square and how to use it	Latin square design	Explanation of the topic with practical application	Quiz
Tenth	Exam				

Eleventh	Two Theoretical + Three Practical	Learn about the method of estimating the missing value and the relative efficiency of the design	Latin square design	Explanation of the topic with practical application	Quiz
Twelfth	Two Theoretical + Three Practical	Learn about factorial experiments and how to use them	Factorial experiments 1	Explanation of the topic with practical application	Quiz
Thirteenth	Two Theoretical + Three Practical	Learn about factorial experiments and how to use them	Factorial experiments 1	Explanation of the topic with practical	Quiz
Fourteenth	Two Theoretical + Three Practical	A quick review of syllabus	General review	Explanation of the topic with practical	Quiz
Fifteenth	Exam				

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	Al-Rawi, Khashi Mahmoud and Khalaf Allah, Abdul Aziz Muhammad (1980). Design and analysis of agricultural experiments
Main References (Sources)	Lectures prepared by the lecturer
Recommended Books and References (Scientific Journals, Reports...)	Nothing
Electronic References, Websites	Nothing

Description of the Fish Marketing Economics Course

1. Course Name:	
Fish Marketing Economics	
2. Course Code:	
001140	
3. Semester / Year:	
First	
4. Description Preparation Date:	
1-3-2025	
5. Available Attendance Forms:	
Full time (theoretical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week for 14 weeks/ 2 units	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Jalal M. EieEmail: jalal.essa@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives: Graduating students who are able to:	1. Identifying the types of fish found in Iraq. 2. Understanding the requirements for live fish during marketing. 3. Exploring the possibility of using various preservation methods during marketing. 4. Providing students with skills for working in the field of fish marketing and its relationship with supply and demand in the market.
9. Teaching and Learning Strategies	
Strategy	1. Empowering students to acquire knowledge and understanding of fish marketing. 2. Empowering students to acquire knowledge and understanding of the relationship between marketing and food economics. 3. Empowering students to acquire knowledge and understanding of the methods employed in fish marketing. 4. Empowering students to acquire knowledge and understanding of the methods employed in preserving marketed fish.

10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Definition for students about the importance of fisheries	Introduction to the importance of fishery resources.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
2	2	Clarification of marketing objectives and its key elements	Explanation of marketing objectives and its key elements.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
3	2	Explanation of marketing services and operations	Clarification of marketing services and processes.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
4	2	Clarification of technical and vital fundamentals in transporting live fish	Explanation of technical and vital fundamentals in live fish transportation.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
5	2	Explanation of critical factors in fish processing	Definition of some important factors in fish processing.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
6	2	Elaboration on fish preservation methods	Explanation of fish preservation methods.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
7	2	Explanation of fish chilling methods	Clarification of fish chilling methods.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
8	2	Elucidation of fish freezing techniques	Explanation of fish freezing techniques.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
9	2	Definition for students about fish assessment and inspection	Introduction to fish assessment and examination	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

10	2	Observing aspects of fish spoilage	Monitoring aspects of fish spoilage	Theoretical lectures + presentation methods +	Daily, monthly and final exams and daily
11	2	Clarification of fish adulteration techniques	Explanation of fish adulteration methods.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
12	2	Illustration of fish packaging and preservation materials	Clarification of fish packaging and preservation materials.	Theoretical lectures + presentation methods +	Daily, monthly and final exams and daily
13	2	Clarification of fish product storage	Explanation of seafood product storage.	Theoretical lectures + presentation methods +	Daily, monthly and final exams and daily
14	2	Introduction to the economics of fisheries marketing	Definition of fish marketing economics.	Theoretical lectures + presentation methods +	Daily, monthly and final exams and daily

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If	
Main References (Sources)	FAO, (2022). The State of World Fisheries and Aquaculture. Sustainability in action. Rome. Farivar, S.; Jalil-Piran, Z.; Zarei, F. and Hosseinzadeh-Sahafi, H. (2017). Intraspecific phylogeography of the Japanese threadfin bream, <i>Nemipterus japonicus</i> (Perciformes: Nemipteridae), from the Persian Gulf and Indo-West Pacific: A preliminary study based on mitochondrial DNA sequence. Iranian Journal of Fisheries Sciences, 16 (2): 587 – 604.
Recommended	Published research related to Fish Marketing
Electronic References,	Webs related to Fish Marketing

Basics of Biotechnology Course Description

1. Course Name:	
Basics of Biotechnology	
2. Course Code:	
001120	
3. Semester / Year:	
Secound	
4. Description Preparation Date:	
1-3-2025	
5. Available Attendance Forms:	
Full time (theoretical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week for 14 weeks/ 3.5 units	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Jalal M. Eie Email: jalalessa@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives: Graduating students who are able to:	1. Study of microscopic organisms and their types: Investigation into microscopic organisms and their classifications. 2. Understanding the role of microscopic organisms in various applied fields: Recognition of the role of microscopic organisms in different applied fields. 3. Possibility of using microorganisms in the field of fish farming and management: Feasibility of employing microorganisms in fish farming and management.
9. Teaching and Learning Strategies	
Strategy	1. Empowering students to acquire knowledge and understanding of biotechnology: Empowering students to gain knowledge and understanding of biotechnology. 2. Empowering students to acquire knowledge and understanding of the relationship between fish farming and biotechnological techniques: Empowering students to gain knowledge and understanding of the relationship between fish farming and biotechnological techniques. 3. Empowering students to acquire knowledge and understanding of the methods used in technologically exploiting fish by-products: Empowering students to gain knowledge and understanding of the methods used in technologically exploiting fish by-products. 4. Empowering students to acquire knowledge and understanding of the methods used in the development of beneficial microorganisms: Empowering students to gain knowledge and understanding of the

10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Providing a general introduction to microbiology	General introduction to microbiology	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
2	5	Explaining the concept of biotechnology	Concept of biotechnology	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
3	5	Selecting strains of microorganisms used in biotechnological techniques	Selection of microbial strains used in biotechnological techniques	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
4	5	Explaining the genetics of industrial microorganisms	Genetics of industrial microorganisms	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
5	5	Clarifying the principles of genetic engineering in improving microbial strains	Principles of genetic engineering in improving microbial strains	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
6	5	Explaining the development methods used in biotechnology	Development methods used in biotechnology	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
7	5	Explaining growth systems in liquid media	Growth systems in liquid environments	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
8	5	Identifying solid-state fermentations	Solid-state fermentations	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
9	5	Clarifying the production of single-cell proteins	Production of single-cell proteins	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

10	5	Understanding the role of modern biotechnology in aquaculture	Role of modern biotechnology in aquaculture	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
11	5	Explaining water quality management and environmental pollution resistance	Water quality management and environmental pollution resistance	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
12	5	Explaining the application of biotechnology in treating water and marine pollution	Application of biotechnology in treating water and marine pollution	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
13	5	Clarifying the production of fish silage using biotechnological techniques	Production of fish silage using biotechnological techniques	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
14	5	Explaining the preparation of protein hydrolysates	Preparation of protein hydrolysates	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

1- 40% for the semester exam

2- 10% for the student's effectiveness in participating in the lecture

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	
Main References (Sources)	Al-Ani, Faiz Aziz (1993). Biotechnology. Dar Al-Kutub for Printing and Publishing, University of Mosul, 292 pp.
Recommended Books and References (Scientific Journals, Reports...)	Published research related to Biotechnologies
Electronic References, Websites	Webs related to Biotechnologies

Course Description of Biochemistry

1. Course Name	
Biochemistry	
2. Course Code	
002130	
3. Semester/Year	
Second/ Third	
4. Date of preparation of this description	
15/ 9/ 2025	
5. Available attendance forms	
Full Time (Theoretical Lecture/Practical Lecture)	
6. Number of credit hours (total) / number of units (total)	
5 hours per week for 14 weeks	
7. Course administrator's name (if more than one name is mentioned)	
Name: Dr. Fatima Abdel Hussein Mohamed Email: fatimamantather49@gmail.com	
8. Course Objectives	
Course Objectives	1- Teaching the student how to identify chemical compounds and provide him with sufficient information that enables him to understand the vital activities taking place in the human body at the molecular level, and apply them with practical lessons. 2- - The ability to understand the metabolic life processes that occur within the body 3- Knowing the defect resulting in any of the food metabolic pathways and the consequent severe health damage in the body. 4- Understand the role that regulated enzymes play in metabolic reactions 5- Know the biological importance of nutrient metabolism pathways and their fate within the body.

9. Teaching and learning strategies

Strategy	- Interactive Teaching Method (Interactive Lecture) - Use the style of discussion and dialogue and ensure the involvement of students - The use of experiential education in conjunction with theoretical lectures with the practical part - The use of educational techniques, modern programs and means of demonstration in lectures
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10. Course Structure

Week	Hours	Required Learning	Unit or subject name	Learning method	Evaluation method
1	5	Definition of biochemistry and life molecules and the basic life molecules in the construction of an organism	Introduction to Biochemistry	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
2	5	Definition of cellular respiration and steps to extract energy from nutrients	Cellular Respiration	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
3	5	Chemical definition and introduction to carbohydrates, The importance of carbohydrates and the division of carbohydrates	Carbohydrates Carbohydrates	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
4	5	The structural formula of monosaccharides, their classification, importance, and interactions	Carbohydrates Carbohydrates	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily

5	5	Epimers Chiral (Assymetric) Carbon Isomers	Carbohydrates Carbohydrates	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
6	5	definition of proteins, their importance, division and structural structure	Proteins	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
7	5	Amino acids and peptides - their classification and vital importance	Amino acids and peptides	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
8	5	Definition of fats , their functions, classification, composition and types of fatty acids	Fat Lipids	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
9	5	Definition, importance, types, classification	Vitamins	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
10	5	Definition, types and importance	Enzymes	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily

11	5	Definition, types and importance	Hormones	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
12	5	Definition of carbohydrate metabolism	Metabolism	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
13	5	Metabolism of proteins and fats	Metabolism	Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
14	5	Exam and access to student reports		Lectures Theoretical and practical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports ... Etc.

12. Learning and Teaching Resources

Required textbooks (methodology, if any)	No
Key references (sources)	Introduction to Biochemistry - written by Prof. Dr. Khawla Ahmed Al Falih Biochemistry - written by Prof. Dr. Qusai Abdul Qader Chalabi
Recommended supporting books and references (scientific journals, reports...)	Journal of Science and Technology on Biochemistry Iraqi National Journal of Chemical Sciences - University of Babylon Arab Journal of Chemistry
Electronic references, websites	hemistry- https://ask https://www.dirassataldokturah.com

Fish Technology Course Description

1. Course Name	
Fish technology	
2. Course Code	
002140	
3. Semester/Year	
Second	
4. Date of preparation of this description	
1/3/2025	
5. Available attendance forms	
Full time (theoretical lecture) weekly	
6. Number of credit hours (total) / number of units (total)	
5 hours / 3.5 credits weekly	
7. Course administrator's name (if more than one name is mentioned)	
Name: Dr. Jalal Muhammad Issa Email: jalal.essa@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives: Graduating students who are able to:	1- Providing students with work skills in the field of fish processing. 2 – Identify the types of fish suitable for manufacturing methods according to their chemical content. 3 – Identify the nutritional and economic value of
9. Teaching and Learning Strategies	
Strategy	1 – Enable students to obtain knowledge and understanding of fish processing. 2 – Enable students to obtain knowledge and understanding in the relationship of fish with lightning conservation and processing. 3 – Enable students to obtain knowledge and understanding of the means used in the exploitation of fish waste. 4 – Enable students to obtain knowledge and understanding of the methods used in storing processed fish

10. Course Structure

The week	Hours	Required Learning Outcomes	The name of the unit or subject	Learning method	Evaluation method
1	5	Introducing the importance of fish	Introduction to the importance of fish processing and development	Theoretical and practical lectures	Daily and monthly tests Final exam
2	5	Clarify the important parts of the fish	Fish Weight Structure and Yield Ratio	Theoretical and practical lectures	Daily and monthly tests Final exam
3	5	clarify the components of a fish, chemically	Chemical composition and nutritional value of fish	Theoretical and practical lectures	Daily and monthly tests Final exam
4	5	Definition of stages after the death of fish	Changes in fish after death	Theoretical and practical lectures	Daily and monthly tests Final exam
5	5	Definition of the most important methods of fish	Methods of preservation and processing of fish	Theoretical and practical lectures	Daily and monthly tests Final exam
6	5	Explain methods of freezing fish	Freeze fish	Theoretical and practical lectures	Daily and monthly tests Final exam
7	5	Explain how to cool fish	Cryopreservation of fish	Theoretical and practical lectures	Daily and monthly tests Final exam
8	5	Clarify the methods of salting fish	Preservation of fish by salting	Theoretical and practical lectures	Daily and monthly tests Final exam
9	5	Explain the ways of drying fish	Preservation of fish by drying	Theoretical and practical lectures	Daily and monthly tests Final exam
10	5	Explain ways to smoke fish	Keeping fish by smoking	Theoretical and practical lectures	Daily and monthly tests Final exam

11	2	Clarify the methods of canning fish	Canning fish preservation	Theoretical and practical lectures +	Daily and monthly tests Final and
12	5	Explain the importance of fish waste	Different uses of fish waste	Theoretical and practical lectures +	Daily and monthly tests Final and
13	5	Explain the most important methods of	Qualitative methods for evaluating fish products	Theoretical and practical lectures +	Daily and monthly tests Final and
14	5	Explain the most important ways to cheat fish products	Fish cheating methods	Theoretical and practical lectures + presentation	Daily and monthly tests Final and daily reports

11. Course Evaluation

according to the tasks assigned to the Distribution of the score out of 100 daily, oral, monthly, written exams, student such as daily preparation, reports ... Etc.

for the semester exam %40 .1

2. 10% for the student's effectiveness in participating in the lecture

12. Learning and Teaching Resources

Required textbooks (methodology, if any)	
Key references (sources)	Al-Taie, Munir Abboud Jassim (1987). Meat and fish technology. Dar Al-Kutub Press, University of Basra, 421 pp. Bulletins of the World Food Organization (FAO) Hindi, Mazen Jamil (1986). Technology of fish products. Dar
Recommended supporting books and references (scientific journals, reports...)	Published research related to fish technology
Electronic references, websites	research links related to fish Various technology

Limnology Course Description

1. Course Name	
Limnology	
2. Course Code	
002130	
3. Semester/Year	
Second/Fourth	
4. Date of preparation of this description	
2025	
5. Available attendance forms	
My attendance is full time	
.6Number of study hours (total) / number of units	
5/ 3.5	
7. Course administrator's name (if more than one name is mentioned)	
Name: Dr. Adel Qasim Jassim	Email: adel.jassim@uobasrah.edu.iq
8. Course Objectives	
Course Objectives	- Understanding the aquatic environment: Introduce students to the concepts of the aquatic environment and its various elements, such as oceans, rivers, lakes and swamps. - Recognizing aquatic biodiversity: studying the biodiversity of aquatic organisms, such as fish, marine animals, algae, corals and microorganisms. - Environmental Analysis and Assessment: Students will learn how to analyze and evaluate the aquatic environment and its sustainability. The importance of managing water resources in sustainable ways will be illustrated and discussed.

9. Teaching and learning strategies

Strategy	1- Enable students to obtain knowledge and understanding of limnology. 2- Enabling students to obtain knowledge and understanding of the means used in the conservation of limnology . 3- Enabling students to obtain knowledge and understanding of the means used to identify and preserve biodiversity in Iraqi rivers.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introducing students to general information about rivers	Introduction to rivers	Lectures Theoretical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
2	2	Introduce students to the importance of water	The importance of water	Lectures Theoretical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily

3	2	Introduce students to the hydrological characteristics of rivers	Hydrological characteristics of rivers	Lectures Theoretical + Views + Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
4	2	Introduce students to the classification of rivers	Classification of rivers	Lectures Theoretical + Views + Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
5	2	Introduce students to the origin and development of rivers	The origin and development of rivers	Lectures Theoretical + Views + Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
6	2	Students know the types of river channels	River canals	Lectures Theoretical + Views + Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
7	2	Students already know the geomorphology of the river	Geomorphological action of the river	Lectures Theoretical + Views + Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily

8	2	Introduce students to waterfalls	Watersheds	Lectures Theoretical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
9	2	Introduce students to sedimentary and floodplains	Sedimentary and floodplains	Lectures Theoretical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
10	2	Introduce the student to the types of lakes	Types of lakes	Lectures Theoretical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
11	2	Teaching students in the classification of lakes	Classification of lakes	Lectures Theoretical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
12	2	Familiarizing students with the environmental factors affecting lakes	BThe environmental factors affecting lakes	Lectures Theoretical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily

13	2	Teach students about the distribution of neighborhoods in lakes	Distribution of organisms in lakes	Lectures Theoretical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily
14	2	How to maintain lakes	Lakes Conservation	Lectures Theoretical + Views +Dialogue and discussion	auditions Daily & Monthly Final and Reports Daily

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily, oral, monthly, written exams, reports ... Etc.

12. Learning and Teaching Resources

Required textbooks (methodology, if any)	Aquatic environment Hussein Ali Alsaadi
Key references (sources)	Rivers behind Hussein 2017
Recommended supporting books and scientific journals,) references reports...)	Limnology: Lake and River Ecosystems ROBERT G. WETZ 2001
Electronic references, websites	limnology Links related to

Aquaculture Engineering Course Description

1. Course Name	
Fish Farms Engineering	
2. Course Code	
002130	
3. Semester/Year	
Second / Third Stage	
4 . Date of preparation of this description	
1/3/2025	
5. Available attendance forms	
Full time (two theoretical and practical lectures) per week	
6. Number of credit hours (total) / number of units (total)	
5 Hours per week for 14 weeks, 3.5 credits	
7. Course administrator's name (if more than one name is mentioned)	
Name: Prof. Riyadh Adnan Irmayla Email : riyadh.irmayla@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives: Graduating students who are able to:	1- Learn the basics of designing and constructing aquaculture systems 2- Learn to design water pumps, fish cages and fish ponds 3- Learn the basics of closed aquaculture systems
9. Teaching and Learning Strategies	
Strategy	- Organize interactive lessons that include discussions and participation activities for students. Practical examples and real case studies of fish farm projects can be presented. Students are encouraged to actively participate and discuss the challenges and opportunities associated with the design and management of fish farms. - Use presentations and multimedia to illustrate engineering concepts and principles related to fish farms. Images, illustrations and videos can be used to illustrate the processes and techniques used in the design of fish farms. - Organizing field visits to local fish farms or specialized research centers. Students have the opportunity to learn about real farms and learn about the challenges facing fish farming.

10. Course Structure

The week	Hours	Required Learning Outcomes	The name of the unit or subject	Learning method	Evaluation method
1	2	Understand the concept of fish farm engineering and its importance.	General introduction	Lectures Theoretical and practical + Views + Dialogue and Discussion +	Daily and monthly tests reports Final and daily
2	2	Learn about the components and types of fish farms.	Water Transportation	Lectures Theoretical and practical + Views + Dialogue and Discussion +	Daily and monthly tests reports Final and daily
3	2	Understand the design of the fish farm and its basic requirements.	Earthen basins 1	Lectures Theoretical and practical + Views + Dialogue and discussion	Daily and monthly tests reports Final and daily
4	2	Study of suitable sites for the establishment of a fish farm.	Earthen Docks 2	Lectures Theoretical and practical + Views + Dialogue and Discussion +	Daily and monthly tests reports Final and daily
5	2	Understand the environmental control systems and lighting in fish farms.	Cages 1	Lectures Theoretical and practical + Views + Dialogue and Discussion +	Daily and monthly tests reports Final and daily
6	2	Understand pond fish farming systems and open systems.	Cages 2	Lectures Theoretical and practical + Views + Dialogue and Discussion +	Daily and monthly tests reports Final and daily
7	2	Study the impact of fish farms on the environment and its sustainability.	Closed System 1	Theoretical lectures + presentation methods + Dialogue and discussion	Daily and monthly tests reports Final and daily
8	2	Study the effect of environmental coefficients on fish farming.	CSS 2	Theoretical lectures + presentation methods + Dialogue and discussion	Daily and monthly tests reports Final and daily
9	2	Understand freshwater and salt water fish farming systems.	Automatic Feeding Systems 1	Theoretical lectures + presentation methods + Dialogue and discussion	Daily and monthly tests Final and daily reports
10	2	Study of health and disease prevention strategies in fish farms.	Automated Feeding Systems 2	Theoretical lectures + presentation methods + Dialogue and discussion	Daily and monthly tests reports Final and daily
11	2	Understand the environmental control systems and lighting in fish farms.	Aquaponics	Theoretical lectures + presentation methods + Dialogue and discussion	Daily and monthly tests reports Final and daily

14- 12	2	Analysis of the costs and benefits of building and operating a fish farm.	General Review	Theoretical lectures + presentation methods + Dialogue and discussion	Daily and monthly tests Final and daily reports
11. Course Evaluation					
- Daily exams with multiple-choice questions that require scientific skills. - Daily exams with scientific questions. - Participation grades for competition questions for academic subjects. - Setting grades for homework and reporting - Grades of the student's activity during the lecture and the extent of his commitment to attendance and non-absence.					
12. Learning and Teaching Resources					
Required textbooks (methodology, if any)					
Key references (sources)			The World Food and Agriculture Organization (FAO): provides a wide range of information and reports on fish farm engineering and fish farming techniques. Link: www.fao.org. Washington Sea Grant provides diverse resources and information on fish farming and fish farming engineering. Link: wsg.washington.edu. Global Aquaculture Alliance website: Provides information and resources about fish farms and best practices in the fish industry. Link: www.aquaculturealliance.org.		
Recommended supporting books and references (scientific journals, reports...)					
Electronic references, websites					

Course Description of Fish Tecnology

1. Course Name:	
Fish Tecnology	
2. Course Code:	
002140	
3. Semester / Year:	
Secound	
4. Description Preparation Date:	
1-3-2025	
5. Available Attendance Forms:	
Full time (theoretical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week for 14 weeks/ 3.5 units	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Jalal M. Eissa Email: jalal.essa@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives: Graduating students who are able to:	1. Providing students with skills in the field of fish processing: Equipping students with work skills in fish processing. 2. Identifying types of fish suitable for processing methods according to their chemical content: Recognizing fish types suitable for processing methods based on their chemical content. 3. Understanding the nutritional and economic value of fish: Understanding the nutritional and economic value of fish. 4. Possibility of using fish by-products in the manufacturing of various food, health, and industrial products: Potential utilization of fish by-products in the production of various food, health, and industrial products.
9. Teaching and Learning Strategies	

Strategy	1. Empowering students to acquire knowledge and understanding of fish processing: Empowering students to gain knowledge and understanding of fish processing. 2. Empowering students to acquire knowledge and understanding of the relationship between fish, its preservation, and processing: Empowering students to gain knowledge and understanding of the relationship between fish, its preservation, and processing. 3. Empowering students to acquire knowledge and understanding of the methods used in utilizing fish by-products: Empowering students to gain knowledge and understanding of the methods used in utilizing fish by-products. 4. Empowering students to acquire knowledge and understanding of the methods used in storing processed fish: Empowering students to gain knowledge and understanding of the methods used in storing processed fish.
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10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Definition of the importance of fish processing	Introduction to the importance of fish processing and its development	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
2	5	Clarification of the important parts of a fish	Weight composition of fish and yield percentage	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
3	5	Explanation of the chemical components of a fish	Chemical composition and nutritional value of fish	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
4	5	Definition of the stages after the death of fish	Changes occurring in fish after death	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
5	5	Definition of the most important fish preservation methods	Methods of preserving and processing fish	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
6	5	Explanation of fish preservation methods by freezing	Freezing fish preservation	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

7	5	Clarification of fish cooling methods	Refrigeration fish preservation	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
8	5	Explanation of fish salting methods	Salting fish preservation	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
9	5	Explanation of fish drying methods	Drying fish preservation	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
10	5	Explanation of fish smoking methods	Smoking fish preservation	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
11	5	Explanation of fish canning methods	Canning fish preservation	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
12	5	Explanation of the importance of fish by-products	Various uses of fish by-products	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
13	5	Explanation of the most important methods for evaluating product quality	Quality assessment methods for fish products	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
14	5	Explanation of the most important methods for adulterating fish products	Fish adulteration methods	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)

Main References (Sources)	FAO, (2022). The State of World Fisheries and Aquaculture. Sustainability in action. Rome. Al-Tai, M. A. J. (1987). Meat and Fish Technology, Dar Al-Kutub Press, University of Basrah Number of Pages: 421. Hindi, M. J. (1986). Technology of fish products. Dar Al-Kutub for Printing and Publishing, University of Mosul
Recommended Books and References (Scientific Journals, Reports...)	Published research related to Fish tecnology
Electronic References, Websites	Webs related to Fish tecnology

Course Description of Biotechnologies

1. Course Name:	
Biotechnologies	
2. Course Code:	
001120	
3. Semester / Year:	
Secound	
4. Description Preparation Date:	
1-3-2025	
5. Available Attendance Forms:	
Full time (theoretical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week for 14 weeks/ 3.5 units	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Jalal M. Eissa Email: jalal.essa@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives: Graduating students who are able to:	5. Study of microscopic organisms and their types: Investigation into microscopic organisms and their classifications. 6. Understanding the role of microscopic organisms in various applied fields: Recognition of the role of microscopic organisms in different applied fields. 7. Possibility of using microorganisms in the field of fish farming and management: Feasibility of employing microorganisms in fish farming and management. 8. Production of various nutritionally valuable compounds from fish and its by-products through microbial means
9. Teaching and Learning Strategies	
Strategy	5. Empowering students to acquire knowledge and understanding of biotechnology: Empowering students to gain knowledge and understanding of biotechnology. 6. Empowering students to acquire knowledge and understanding of the relationship between fish farming and biotechnological techniques: Empowering students to gain knowledge and understanding of the relationship between fish farming and biotechnological techniques. 7. Empowering students to acquire knowledge and understanding of the methods used in technologically exploiting fish by-products: Empowering students to gain knowledge and understanding of the methods used in technologically exploiting fish by-products. 8. Empowering students to acquire knowledge and understanding of the methods used in the development of beneficial microorganisms: Empowering students to gain knowledge and understanding of the methods used in the development of beneficial microorganisms

10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Providing a general introduction to microbiology	General introduction to microbiology	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
2	5	Explaining the concept of biotechnology	Concept of biotechnology	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
3	5	Selecting strains of microorganisms used in biotechnological techniques	Selection of microbial strains used in biotechnological techniques	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
4	5	Explaining the genetics of industrial microorganisms	Genetics of industrial microorganisms	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
5	5	Clarifying the principles of genetic engineering in improving microbial strains	Principles of genetic engineering in improving microbial strains	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
6	5	Explaining the development methods used in biotechnology	Development methods used in biotechnology	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
7	5	Explaining growth systems in liquid media	Growth systems in liquid environments	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
8	5	Identifying solid-state fermentations	Solid-state fermentations	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
9	5	Clarifying the production of single-cell proteins	Production of single-cell proteins	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

10	5	Understanding the role of modern biotechnology in aquaculture	Role of modern biotechnology in aquaculture	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
11	5	Explaining water quality management and environmental pollution resistance	Water quality management and environmental pollution resistance	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
12	5	Explaining the application of biotechnology in treating water and marine pollution	Application of biotechnology in treating water and marine pollution	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
13	5	Clarifying the production of fish silage using biotechnological techniques	Production of fish silage using biotechnological techniques	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
14	5	Explaining the preparation of protein hydrolysates	Preparation of protein hydrolysates	Theoretical and practical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

3- 40% for the semester exam

4- 10% for the student's effectiveness in participating in the lecture

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	
Main References (Sources)	Al-Ani, Faiz Aziz (1993). Biotechnology. Dar Al-Kutub for Printing and Publishing, University of Mosul, 292 pp.
Recommended Books and References (Scientific Journals, Reports...)	Published research related to Biotechnologies
Electronic References, Websites	Webs related to Biotechnologies

Course Description of Fish Marketing

1. Course Name:	
Fish Marketing	
2. Course Code:	
002140	
3. Semester / Year:	
First	
4. Description Preparation Date:	
1-3-2025	
5. Available Attendance Forms:	
Full time (theoretical lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week for 14 weeks/ 2 units	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Jalal M. Eissa Email: jalal.essa@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives: Graduating students who are able to:	5. Identifying the types of fish found in Iraq. 6. Understanding the requirements for live fish during marketing. 7. Exploring the possibility of using various preservation methods during marketing. 8. Providing students with skills for working in the field of fish marketing and its relationship with supply and demand in the market.
9. Teaching and Learning Strategies	
Strategy	5. Empowering students to acquire knowledge and understanding of fish marketing. 6. Empowering students to acquire knowledge and understanding of the relationship between marketing and food economics. 7. Empowering students to acquire knowledge and understanding of the methods employed in fish marketing. 8. Empowering students to acquire knowledge and understanding of the methods employed in preserving marketed fish.

10. Course Structure

Week	Hours	Required learning outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Definition for students about the importance of fisheries	Introduction to the importance of fishery resources.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
2	2	Clarification of marketing objectives and its key elements	Explanation of marketing objectives and its key elements.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
3	2	Explanation of marketing services and operations	Clarification of marketing services and processes.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
4	2	Clarification of technical and vital fundamentals in transporting live fish	Explanation of technical and vital fundamentals in live fish transportation.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
5	2	Explanation of critical factors in fish processing	Definition of some important factors in fish processing.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
6	2	Elaboration on fish preservation methods	Explanation of fish preservation methods.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
7	2	Explanation of fish chilling methods	Clarification of fish chilling methods.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
8	2	Elucidation of fish freezing techniques	Explanation of fish freezing techniques.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
9	2	Definition for students about fish assessment and inspection	Introduction to fish assessment and examination	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
10	2	Observing aspects of fish spoilage	Monitoring aspects of fish spoilage	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

11	2	Clarification of fish adulteration techniques	Explanation of fish adulteration methods.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
12	2	Illustration of fish packaging and preservation materials.	Clarification of fish packaging and preservation materials.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
13	2	Clarification of fish product storage	Explanation of seafood product storage.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports
14	2	Introduction to the economics of fisheries marketing	Definition of fish marketing economics.	Theoretical lectures + presentation methods + dialogue and discussion	Daily, monthly and final exams and daily reports

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports, etc.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	
Main References (Sources)	FAO, (2022). The State of World Fisheries and Aquaculture. Sustainability in action. Rome. Farivar, S.; Jalil-Piran, Z.; Zarei, F. and Hosseinzadeh-Sahafi, H. (2017). Intraspecific phylogeography of the Japanese threadfin bream, <i>Nemipterus japonicus</i> (Perciformes: Nemipteridae), from the Persian Gulf and Indo-West Pacific: A preliminary study based on mitochondrial DNA sequence. Iranian Journal of Fisheries
Recommended Books and References (Scientific Journals, Reports...)	Published research related to Fish Marketing
Electronic References, Websites	Webs related to Fish Marketing