

نموذج توصيف مقرر
Course Description Form

Name of College\Faculty : Faculty of Science
Name of Department: Biological Science Department

اسم الكلية:
اسم القسم العلمي:

Course Name	فسيولوجيا الأسماك Fish physiology	اسم المقرر
Course No.	0493412	رقم المقرر
No. of Credits	3	عدد الوحدات
Theoretical Hours	2	عدد الساعات النظرية
Practical Hours	1	عدد الساعات المحلية
Course topics		مواضيع المقرر

1. Physical and chemical properties of water

- Solubility of gases in water.
- Effects of temperature and salinity.
- Thermal properties of water. Density and Viscosity.
- Flow properties of water.

2. Respiration and circulation

- Design of gills.
- Counter current exchange and extraction efficiency.
- Ventilation and its control.
- The fish heart and single circulation.
- Respiratory properties of fish blood.

3. Air breathing fish

- Respiratory and circulatory adaptation of air breathing fish.
- Ecological differences in marine and freshwater air breather.

4. Digestion, nutrition and Metabolism

- The fish digestive system and its specialization.
- Nutrition and metabolism of fish with emphasis on their relevance to fish farming.

5. Swimming

- Generation of propulsive forces.
- Body hydrodynamics.
- Muscle types.
- Muscle homeothermy.
- Physiology of exercise.
- Migration.

6. Buoyancy

- The swim bladder and its function.
- Gas secretion and absorption.
- The rete as a counter current multiplier.
- Use of fat as a buoyancy mechanism.

7. Osmoregulation

- Problems of osmoregulation in marine and freshwater environments.
- Extra-renal salt excretion and absorption.
- Problems of anadromous and catadromous fish.
- Use of plasma urea in osmoregulation.

8. Nervous system and special senses

- General structure of fish nervous system.
- Mauthner axons and escape reflexes.
- The lateral line system.
- Electoreceptors and electric organs.
- The olfactory system.

Text book: (Name, Author , Year , Publisher)

عنوان الكتاب : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)

- **Fishes: An introduction to ichthyology by Peter B. Moyle and Joseph J. Cech, Jr. Pearson Prentice Hall 5th edition .**

- **The diversity of Fishes: biology, evolution and ecology by Douglas E. Facey , Brian W. Bowen , Bruce B. Collette and Gene S. Helfman . Wiley 3rd edition**

عنوان المرجع : (الاسم ، المؤلف ، سنة الطبع ، دار النشر)
References: (Name , Author , Year . Publisher)

Prerequisites			متطلبات المقرر		
Grading	Exams	20	%		الاختبارات
	Quizzes		%		امتحانات قصيرة
	Lab work	30	%		مختبر
	Project (field study)	10	%		مشاريع (دراسة ميدانية)
	Final	40	%		الاختبار النهائي
			100%		

Course objectives					
No.	Course Objectives (Learning Outcomes)	Example(s) of relevant (Topics and activities)	Recommended Level to satisfy the objectives		
			High	Medium	Low
1	Identify the various structure and function of major physiological systems in fishes (respiratory, circulatory, osmoregulatory, excretory, digestive, endocrine, nervous, and reproductive systems).	The fish digestive system and its specialization, the olfactory system of fish and Mauthner axons and escape reflexes	×		
2	Explain the core physiological basis of migration, buoyancy regulation, and sensory adaptations.	Buoyancy , nervous system , special senses and swimming	×		
3	Analyze how environmental factors (temperature, oxygen, salinity, pH, pollutants) affect fish physiology and behavior.	Air breathing fish		×	

4	Analyze the biochemical and molecular mechanisms underlying key physiological processes in fishes.	Fish osmoregulation, Muscle types and the rete		×	
5	Relate physiological traits to ecological aspects in fish	Fish aquaculture and farming		×	
Fields					
Skills					
Coordinator (Name and Rank) :	Bedour Alsayegh (Assistant Prof.)				
Signature and stamp :	Bedour Alsayegh				
Date:	09 \11 \2025				