Course E-Syllabus

1	**Course title**	Marine Biology and Ecology
2	**Course number**	0304472
3	**Credit hours**	3
	Contact hours (theory, practical)	(3,0)
4	**Prerequisites/corequisites**	General Zoology 0304261
5	**Program title**	B.Sc. Biological Sciences
6	**Program code**	04
7	**Awarding institution**	The University of Jordan
8	**School**	Science
9	**Department**	Biological Sciences
10	**Level of course**	3rd or 4th year level
11	**Year of study and semester (s)**	2010/2021 Fall
12	**Final Qualification**	B.Sc.
13	**Other department (s) involved in teaching the course**	N/A
14	**Language of Instruction**	English
15	**Teaching methodology**	☐Blended ☒Online
16	**Electronic platform(s)**	☒Moodle ☒Microsoft Teams ☐Skype ☐Zoom ☐Others……
17	**Date of production/revision**	11 Oct. 2020

18 Course Coordinator:

Name: **Dr. Mamoon Al-Rshaidat**
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19 Other instructors:

N/A

20 Course Description:

As stated in the approved study plan.

Physical and chemical properties of water; basic oceanography; some ecological principles; division of the marine environment; planktons; oceanic nekton; deep sea biology; shallow- water subtidal benthos; intertidal ecology; meiofauna (small animals living in soil and aquatic sediments); tropical communities; symbiotic relationships; human impact on the sea.

21 Course aims and outcomes:

A- Aims:

The course aims at:

1. Having the students acquire basic concepts in marine ecology and biology
2. Familiarize the students with the main divisions of the marine environment and their main characteristics, with emphasis on the Jordanian Gulf of Aqaba.
3. Familiarize the students with the main primary producers
4. Introduce the students to the main marine systems and the organisms associated with them
5. Introduce the students to the marine resources and concepts of marine ecosystem services, Jordanian Gulf of Aqaba as example.
6. Familiarize the students with the human impacts on the marine environment and basics of planning and management in conservation strategies, and introduce the students to issues facing the Jordanian Gulf of Aqaba environment.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to:

1. Demonstrate knowledge and understanding in the main characteristics of the marine environment and the adaptations of the marine organisms.
2. Describe the main marine ecosystems and marine communities associated with them
3. Discuss the importance of primary producers and their impact on biogeochemical cycles
4. Describe the main marine resources and the importance of the ecosystem services they provide.
5. Describe main human impacts on the marine environment and the strategies for conservation.

22. Topic Outline and Schedule:

Week	Lecture	Topic	Teaching Methods*/ platform*	Evaluation Methods**	References
1	1	Intro to course	*	**	
	2	Ch. 6: Water and Ocean Structure 6.1 A Note to the Reader 6.2 The Water Molecule Is Held Together by Chemical Bonds	*	**	
	3	6.3 Water Has Unusual Thermal Characteristics	*	**	

2	1	6.4 Surface Water Moderates Global Temperature	*	**	
	2	6.5 The Ocean Is Stratified by Density *6.6 – Not included – Refraction Can Bend the Paths of Light and Sound through Water* *6.7 Light Does Not Travel Far through the Ocean* *6.8 – Not included – Sound Travels Much Farther Than Light Through the Ocean*	*	**	
	3	Review	*	**	
3	1	Ch. 7: Ocean Chemistry 7.1 Water Is a Powerful Solvent	*	**	
	2	7.2 Seawater Consists of Water and Dissolved Solids	*	**	
	3	7.3 Gases Dissolve in Seawater 7.4 The Ocean's Acid-Base Balance Varies with Dissolved Components and Depth	*	**	
4	1	**First Exam**	*	**	
	2	Ch. 8: Circulation of the Atmosphere 8.1 The Atmosphere and Ocean Interact with Each Other 8.2 The Atmosphere Is Composed Mainly of Nitrogen, Oxygen, and Water Vapor	*	**	
	3	8.3 The Atmosphere Moves in Response to Uneven Solar Heating and Earth's Rotation 8.4 Atmospheric Circulation Generates Large-Scale Surface Wind Patterns *8.5 – Not included – Storms Are Variations in Large-Scale Atmospheric Circulation* *8.6 – Not included – The Atlantic Hurricane Season of 2005 Was the Most Destructive Ever Recorded*	*	**	
5	1	Review	*	**	
	2	Ch. 9: Circulation of the Ocean 9.1 Mass Flow of Ocean Water Is Driven by Wind and Gravity	*	**	
	3	9.2 Surface Currents Are Driven by the Winds	*	**	
6	1	9.3 Surface Currents Affect Weather and Climate	*	**	
	2	9.4 Wind Can Cause Vertical Movement of Ocean Water *9.5 – Not included – El Niño and La Niña Are Exceptions to Normal Wind and Current Flow* *9.6 – Not included – Thermohaline Circulation Affects All the Ocean's Water* *9.7 – Not included – Studying Currents*	*	**	
	3	Review	*	**	
7	1	Ch. 12: Coasts 12.1 Coasts Are Shaped by Marine and Terrestrial Processes 12.2 Erosional Processes Dominate Some Coasts *12.3 – Not included – Beaches Dominate Depositional Coasts* *12.4 – Not included – Larger-Scale Features Accumulate on Depositional Coasts*	*	**	
	2	12.5 Biological Activity Forms and Modifies Coasts	*	**	

		12.6 – Not included – Fresh Water Meets the Ocean in Estuaries *12.7 – Not included – The Characteristics of U.S. Coasts* 12.8 Humans Interfere in Coastal Processes			
	3	Review	*	**	
8	1	Ch. 13: Life in the Ocean 13.1 Life on Earth Is Notable for Unity and Diversity	*	**	
	2	13.2 The Flow of Energy through Living Things Allows Them to Maintain Complex Organization	*	**	
	3	13.3 Primary Productivity Is the Synthesis of Organic Materials 13.4 Living Organisms Are Built from a Few Elements	*	**	
9	1	13.5 Elements Cycle between Living Organisms and Their Surroundings	*	**	
	2	13.6 Marine Life Success Depends upon Physical and Biological Environmental Factors	*	**	
	3	13.7 The Marine Environment Is Classified in Distinct Zones *13.8 – Not included – The Concept of Evolution Helps Explain Life in the Ocean* *13.9 – Not included – Oceanic Life Is Classified by Evolutionary Heritage*	*	**	
10	1	Ch. 14: Plankton, Algae, and Plants 14.1 Plankton Drift with the Ocean	*	**	
	2	14.2 Plankton Collection Methods Depend on the Organism's Size14.3 Phytoplankton Are Autotrophs *14.4 – Not included – Primary Productivity May Be Measured Using Radioactive "Tags"*	*	**	
	3	14.5 Lack of Nutrients and Light Can Limit Primary Productivity	*	**	
11	1	14.6 Production Equals Consumption at the Compensation Depth	*	**	
	2	14.7 Phytoplankton Productivity Varies with Local Conditions *14.8 Zooplankton Consume Primary Producers (will be discussed in next chapter)*	*	**	
	3	14.9 Seaweeds and Marine Plants are Diverse and Efficient Primary Producers 14.9 Primary Productivity Also Occurs Deep in the Water Column – Not found in the chapter	*	**	
12	1	Review	*	**	
	2	Ch. 16: Marine Communities 16.1 Marine Organisms Live in Communities	*	**	
	3	16.2 Communities Consist of Interacting Producers, Consumers, and Decomposers	*	**	
13	1	16.3 Marine Communities Change as Time Passes	*	**	
	2	16.4 Examples of Marine Communities	*	**	
	3	16.5 Organisms in Communities Can Live in Symbiosis	*	**	
14	1	Ch. 18: The Ocean and the Environment 18.1 An Introduction to Marine Environmental Issues	*	**	

	2	18.2 Marine Pollutants May Be Natural or Human-Generated	*	**	
	3	18.3 Organisms Cannot Prosper if Their Habitat Is Disturbed	*	**	
15	1	18.4 Marine Conservation Areas Offer a Glimmer of Hope	*	**	
	2	18.5 Human Activity Is Causing Global Oceanic Change	*	**	
	3	18.6 What Can Be Done?	*	**	

* Teaching methods include: Synchronous lecturing/meeting; Asynchronous lecturing/meeting
* Platform is Microsoft Teams; unless otherwise indicated by your instructor
** Evaluation methods include: First exam, Midterm exam, and Final exam

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23 Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	Period (Week)	Platform
Participation	5	Active participation	During all semester	Live meetings
Quizzes	15	-	During all semester	-
Midterm Exam	30	Chapters 8, 9 and 12	8	-
Final Exam	50	All material	15	-

24 Course Requirements (e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):

Student are **required** to have access to the following:

- A computer (with webcam & microphone)
- Active and dependable internet connection
- E-Learning website (not the mobile application) works smoothly on their computer.
- Make sure to install the application (platform) which will be used by your instructor to conduct the live meetings (Microsoft Teams).

25 Course Policies:

A- Attendance policies:
Absence from lectures should not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course.

B- Absences from exams and submitting assignments on time:
You should contact **your instructor** as soon as possible if you miss an exam. All such cases will be dealt with according to the rules outlined in your student handbook.

C- Health and safety procedures:
N/A

D- Honesty policy regarding cheating, plagiarism, misbehavior:
All violations pertaining to cheating, plagiarism, misbehavior will be dealt with in accordance to the rules outlined in your student handbook.

E- Grading policy:
Exams that are made up of MCQ's, True/False, short answer, and essay questions.

F- Available university services that support achievement in the course:
- Microsoft Teams → live meeting → https://teams.microsoft.com
- University of Jordan's E-Learning online educational portal → http://www.elearning.ju.edu.jo
- Optional mobile application to access E-Learning platform (Moodle)

26 References:

A- Required book (s), assigned reading and audio-visuals:

"***Oceanography: An Invitation to Marine Science***" by Tom S. Garrison. 9th Edition. Brooks Cole Publishing, ©2010, 2011, 2016

B- Other, materials, and media.
Provided by instructor

27 Additional information:

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Name of Course Coordinator: **Dr. Mamoon Mustafa Al-Rshaidat** Signature: ---------- Date: --------

Head of Curriculum Committee/Department: ---------- Signature: ----------

Head of Department: ---------- Signature: ----------

Head of Curriculum Committee/Faculty: ---------- Signature: ----------

Dean: ---------- Signature: ----------