مركز الاعتماد وضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER

Course Syllabus

1	**Course title**	Special Topics	
2	**Course number**	0302496	
3	**Credit hours**	3h	--
	Contact hours (theory, practical)	3h, 0h	
4	**Prerequisites/corequisites**	Department Approval	
5	**Program title**	B.Sc. Physics	
6	**Program code**	0302	
7	**Awarding institution**	University of Jordan	
8	**School**	School of Science	
9	**Department**	Physics	
10	**Course level**	Bachelor	
11	**Year of study and semester (s)**	3rd and 4th year (all semesters)	
12	**Other department (s) involved in teaching the course**	--	
13	**Main teaching language**	English	
14	**Delivery method**	☑Face to face learning ☐Blended ☐Fully online	
15	**Online platforms(s)**	☑Moodle ☑Microsoft Teams ☐Skype ☐Zoom ☐Others……	
16	**Issuing/Revision Date**	7 July 2024	

17 Course Coordinator:

Name: Prof. Riyad Manasrah	Contact hours: Sun, Tue, Thu 11:00-12:00; Mon, Tue. 13:30-14:30
Office number: 016	Phone number: 22023
Email: r.manasrah@ju.edu.jo	

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18 Other instructors:

Name: Office number: Phone number: Email: Contact hours: Name: Office number: Phone number: Email: Contact hours:

19 Course Description:

This course covers physical-oceanographic processes, theories, data, and measurements. The course focuses on wind, radiation, gravity, friction, and the Earth's rotation determine the ocean's temperature and salinity patterns and currents. Some important process we will study include heat budget of the oceans, exchange of heat with the atmosphere and the role of the ocean in climate, surface mixed layer, waves in the ocean, geostrophy, Ekman transport, upwelling, Rossby waves, subtropical gyres, western and eastern boundary currents.

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20 Course aims and outcomes:

A- Aims:

1. Determine the basic physical characteristics of seawater.
2. Clarifying and explaining the types of heat flow between atmosphere and oceans, and their importance on environmental and climate stability.
3. Describe and understand the application of equations of motion and continuity in oceans.
4. Explaining the types of driven forces and currents in oceans.
5. Clarifying and explaining geostrophic currents: their causes, calculations and interpretations.
6. Explaining the Coriolis force: its causes and effect on ocean currents.
7. Clarifying and explaining deep currents: their types, causes and importance.

Providing students with a scientific details and deep understanding of physics oceanography for further studies or work in physics, oceanography, engineer and technology.

B- Students Learning Outcomes (SLOs):

For purposes of mapping the course SLOs to the physics program SLOs, at the successful completion of the physics program, graduates are expected to be able to:

SLO (1) Master professionally a broad set of knowledge concerning the fundamentals in the basic areas of physics: Quantum Mechanics, Classical Mechanics, Electrostatics and Magnetism, Thermal Physics, Optics, Theory of Special Relativity, Mathematical Physics, Electronics.

SLO (2) Apply knowledge of mathematics and fundamental concepts in the basic areas of physics to identify and solve physics related problems.

SLO (3) Utilize computers and available software in both data collections and data analysis.

SLO (4) Utilize standard laboratory equipment, modern instrumentation, and classical techniques to design and conduct experiments as well as to analyze and interpret data.

SLO (5) Develop a recognition of the need and ability to engage in life-long learning.

SLO (6) Demonstrate ability to use techniques, skills, and modern scientific tools necessary for professional practice.

SLO (7) Communicate clearly and effectively in both written and oral forms.

SLO (8) Apply proficiently team-work skills and employ team-based learning strategies.

SLO (9) Apply professional and ethical responsibility to society

Program SLOs / Course SLOs	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)	SLO (8)	SLO (9)
1. Learning key terms related to physical oceanography.	✓	✓							
2. Applying knowledge and understanding to solve mathematical problems related to physical oceanography	✓	✓							
3. Understand the physical processes that control the distribution of water properties and the movement of those properties in the ocean.	✓	✓							
4. To demonstrate awareness of methods to sample the physical variables of the ocean system	✓	✓							
5. Knowing how the ocean affects with the rest of the climate system and how it is affected by Global Warming	✓	✓							

21. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	4	Chapter 1 A Voyage of Discovery	1	Face to Face	Class room, Teams	Synchronous	Quiz, Midterm Exam, Final Exam	Robert H. Stewart (2008) Introduction To Physical Oceanography. Department of Oceanography Texas A & M University.
		Chapter 2 The Historical Setting	1					
2	5	Chapter 5 The Oceanic Heat Budget	1,2					
		Chapter 6 Temperature, Salinity, and Density	1,2					

3	5	Chapter 7 Some Mathematics: - The Equations of Motion	1,2					
4	5	Chapter 9 Response of the Upper Ocean to Winds	1,2					
5	5	Chapter 10 Geostrophic Currents	1,2					
6	5	Chapter 13 Deep Circulation in the Ocean	1,2					

22 Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Quizzes	20%	Ch.1, 2, 7, 9	1, 2	2, 5	Paper Quiz
Midterm Exam	30%	Ch. 1, 2, 5, 6, 7	1,2	4	Paper Exam
Final Exam	50%	All topics	1,2	7	Paper Exam

23 Course Requirements

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

Textbook, computer, Internet access, Microsoft Teams

24 Course Policies:

A- Attendance policies:

Students are expected to attend all classes. Absence should not exceed 15%.

B- Absences from exams and submitting assignments on time:

Exam makeups will be arranged for students with valid absence excuses.

C- Health and safety procedures:

Students are required to abide by all mandated health and safety procedures.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Cheating, plagiarism, and misbehavior will be dealt with according to University regulations.

E- Grading policy:

Quizzes and seminar: 20%, Midterm Exam: 30%, Final Exam: 50%.

F- Available university services that support achievement in the course:

Microsoft Teams, E-Learning platform, Moodle.

25 References:

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

- Robert H. Stewart (2008) Introduction To Physical Oceanography. Department of Oceanography Texas A & M University.

https://www.colorado.edu/oclab/sites/default/files/attached-files/stewart_textbook.pdf

B- Recommended books, materials, and media:

- Yakov Afanasyev (2016) Physical Oceanography: A short course for beginners. 1st edition. Smithville Crescent Publishing.
- PICKARD, G.L. AND EMERY, W.H. (1982) Descriptive Physical Oceanography: An Introduction (4th (SI) enlarged edn), Pergamon Press.
- POND, S. AND PICKARD, G.L. (1983) Introductory Dynamic Oceanography, Pergamon Press.
- GLANTZ, M.H. (2001) Currents of Change: Impacts of El Niiio and La Niiia on Climate and Society (2nd edn), Cambridge University Press.
- TOMCZAK, M. AND GODFREY, 1.S. (1994) Regional Oceanography: An Introduction, Pergamon Press.

26 Additional information:

Name of Course Coordinator: Prof. Riyad Manasrah Signature:  Date: 7/7/2024
Head of Curriculum Committee/Department: ---------- Signature: ----------
Head of Department: ---------- Signature: ----------
Head of Curriculum Committee/Faculty: ---------- Signature: ----------
Dean: ---------- Signature: ----------