

Course Syllabus

1	Course title	Applied Geophysics	
2	Course number	0365371	
3	Credit hours	2 hours weekly	
	Contact hours (theory, practical)	2 hours.	
4	Prerequisites/corequisites	0305271 Fundamentals of Geophysics	
5	Program title	B.Sc. Program in Environmental and Applied Geology	
6	Program code	0305	
7	Awarding institution	The University of Jordan	
8	School	School of Science	
9	Department	Geology Department	
10	Course Level	3 rd and 4 th -year B.Sc.	
11	Year of study and semester (s)	2023/2024 Fall Semester\ First Semester	
12	Other department (s) involved in teaching the course	NA	
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..... WhatsApp	
16	Issuing/Revision Date	1.10.2023	

17 Course Coordinator:

Dr Mu'ayyad Al Hseinat, Office No. Geo 211

Phone number: +962-6-5355000, Ext. 22262

Office hours: Everyday (9:30-10:30) and 13:30-14:30).

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**18. Other instructors:**

NA

19. Course Description:

An undergraduate course worth 2 credits delves into the exploration of applied geophysical methods, instrumentation, and field methodology. The curriculum focuses on analyzing physical parameters and geophysical anomalies to interpret subsurface geological structures. The covered geophysical methods encompass Earthquake, Reflection seismic, GPR, gravity, magnetic, electric, geothermal, and integrated geophysical studies.

20. Course aims and outcomes:

A- Aims: Intended learning outcomes (**ILOs**)

Acquaint students with a basic understanding of Seismology, i.e., Investigating Earth's structures by seismic waves, Plate movement causes Earthquakes, Seismicity of Jordan, Seismic station, Earthquake prediction and mitigation. The topics covered in this course will allow the students to better understand the main sources that caused Earthquakes.

- The objectives of this course are to introduce students to the important concepts and topics of different seismological terms and their importance, i.e., earthquake prediction, Magnitude, Intensity, Earthquake focus & epicentre, earthquake mitigation, Risk and Hazard, and Vulnerability map.

The objectives of this course are to introduce students to the important concepts and topics of seismic hazards and environmental geology. The course will also teach students about the internal and external earth processes, their hazards to life and property, and the most common methods to mitigate them. The following topics will be covered:

- ✓ Introduction to Seismology.
- ✓ Rock deformation (Stress and strain).
- ✓ Seismic waves (Body and surface waves).
- ✓ Seismology and earthquakes.
- ✓ Magnitude Scale.
- ✓ Intensity Scale.
- ✓ How to locate an earthquake epicentre.
- ✓ Seismic hazard and risk.
- ✓ Vulnerability map.

B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

SLOs SLOs of the course	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)	SLO (8)	SLO (9)
1. Identify the Seismicity and major processes that play a role in causing an Earthquake.	X	X							X
2. Understand the different types of plate boundaries and their relationship to cause Earthquakes with special focus	X	X			X				

on the focus and epicentre of an Earthquake event.									
3. Describe the scientific method used in Earthquake prediction.	X		X					X	
4. Identify the occurrence and classification of earth's materials (rocks and minerals) using seismic waves.	X	X	X				X		
5. Explain the theory of plate tectonics and its relationship with earthquake generation.	X	X							
6. Understand and explain the most common methods used to locate an earthquake epicentre.	X	X					X		

21. Topic Outline and Schedule:

Week	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1. Introduction to Seismology	1, 2, 3	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes
2-3	2. Rock deformation (Stress and strain)	4	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes
3-4	Seismic waves (Body and surface waves)	5, 6	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes
4-5	Seismology and Earthquakes	6, 8	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes
5	Magnitude Scale	6, 8	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes
5	Intensity Scale	7, 8	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes

6	How to locate an earthquake epicentre	7, 8	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes
6-7	Seismic hazard and risk	7, 8	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes
7	Vulnerability map	7, 8	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes
8	Earthquake-induced landslides	7, 8	Face-to-face	E-learning	Face-to-face	Midterm exam, Presentation, and Final Exam	Textbook, Lecture Notes

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
Midterm exam	30	1, 2, 3,4	1, 2, 3, 4	Week 4-5	Face to Face
Project one (Earthquake data)	10	1-8	1-8	1-8	Face to Face
Project two (Reflection seismic data)	10	1-10	1-8		Face to Face
Final Exam	50	1-10	1-8	Week 9	Face to Face

23 Course Requirements

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

Students need a computer (or smartphone) and internet access to watch important videos.

24 Course Policies:

A- Attendance policies:

Attendance is compulsory and not to exceed (with acceptable excuse only) 15% of the total lectures, the student will automatically be deprived if he exceeds this limit. A small fraction of the mark will be allocated to attendance.

B- Absences from exams and submitting assignments on time:

It is not allowed to be absent from the exams, in case of compelling conditions, a makeup exam will be held. The assignments should be all delivered on time.



C- Health and safety procedures:

NA

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

There will be no leniency or tolerance with regard to cheating and system bypass issues, necessary actions will be taken by the department committee.

E- Grading policy:

As seen in section 22 above.

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

The main library, computer rooms with internet access.

25 References:

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

-Introduction to Seismology, 2nd Edition. Author(s): P. Shearer 2009. Information on this title: www.cambridge.org/9780521882101

-YouTube channel, Internet, Support material (s): presentations, homework and video clips.

26 Additional information:

Thinking and analysis

The thinking skills will be developed by encouraging students to conclude answers to different questions that the instructor intends to use during the presentation of the scientific material. The instructor intends to stimulate the student`s analytical thinking side via connections with general aspects of daily life or through questions, net searching, and homework.

Name of Course Coordinator: Mu'ayyad Al Hseinat Signature: -----	Date: 1/10/2023-----
Head of Curriculum Committee/Department: -----	Signature: -----

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