

Course Syllabus

1	Course title	Fundamentals of Geophysics	
2	Course number	0305271	
3	Credit hours	3 hours weekly	
	Contact hours (theory, practical)	Three times a week.	
4	Prerequisites/corequisites	0335101 (General Geology), General Physics	
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	First-year B.Sc.	
11	Year of study and semester (s)	2025/2026 First Semester	
12	Other department (s) involved in teaching the course	-----	
13	Main teaching language	English	
14	Delivery method	<input type="checkbox"/> Face to face learning <input checked="" type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	Online platforms(s)	Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
16	Issuing/Revision Date	10/10/2025	

17 Course Coordinator:

Name:	Dr. Wadah F. Mahmoud	Contact hours:	Sunday 13:30-17:30
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18 Other instructors:

19 Course Description:

As stated in the approved study plan.

A 3-hour credit undergraduate course covers topics related mainly to the study of various applied geophysical methods, instrumentation, and field methodology. Analysis of physical parameters and geophysical anomalies, to interpret sub-surface geological structures. Geophysical methods include gravity, magnetic, electric, seismic, geothermal, and integrated geophysical studies.

Course aims and outcomes: A- Aims:

Acquaint students with a basic understanding of Geophysics, i.e., classifications; development; application: exploration for oil & gas, underground water, ore deposits, and other applications.

- The objectives of this course are to introduce students to the important concepts and topics of different geophysical techniques and their importance, i.e., reflection seismic, refraction seismic, Electrical & Electromagnetic Methods, and Gravity & Magnetic Methods. The following topics will be covered:

Acquaint students with basic information about Geophysical methods which are concerned with the interactions between humans and the geological environment. The objectives of this course are to introduce students to the important concepts and topics of 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 geophysics.
- ✓ Active and passive methods
- ✓ Approaching the Subsurface and Earth's Interior
- ✓ Gravity method.
- ✓ Magnetic method.
- ✓ Resistivity method.
- ✓ Seismology and earthquakes.
- ✓ Seismic methods (Reflection and refraction).
- ✓ Ground penetrating radar method (GPR).

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 term geophysics and understand its classification and development.	X	X							X
2. Describe the scientific method as applied to the geophysical method.	X	X			X				
3. Understand the benefit of each individual method in the exploration field.	X		X					X	

4. Identify the occurrence and classification of earth's materials (rocks and minerals).	X	X	X				X		
5. Explain the theory of plate tectonics and tectonic hazards.	X	X							
6. Understand and explain the most common methods used to study subsurface rock deformation.	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 + 2	1. Introduction to geophysics	1, 2, 3	Blinded	E-learning	Synchronous	Quizzes, First Exam, Final Exam	Textbook, Lecture Notes
3	2. Rock deformation	4	Blinded	E-learning	Synchronous	Quizzes, First Exam, Final Exam	Textbook, Lecture Notes
4 + 5	Active and passive geophysical methods	5, 6	Blinded	E-learning	Synchronous	Quizzes, Second Exam, Final Exam	Textbook, Lecture Notes
6 + 7	Approaching the Subsurface and Earth's Interior	6, 8	Blinded	E-learning	Synchronous	Quizzes, Second Exam, Final Exam	Textbook, Lecture Notes
8 + 9	Seismology and Earthquakes	6, 8	Blinded	E-learning	Synchronous	Quizzes, Second Exam, Final Exam	Textbook, Lecture Notes
10-11	Gravity method	7, 8	Blinded	E-learning	Synchronous	Quizzes, Final Exam	Textbook, Lecture Notes
12 + 13	Gravity method	7, 8	Blinded	E-learning	Synchronous	Quizzes, Final Exam	Textbook, Lecture Notes
14	Magnetic method	7, 8	Blinded	E-learning	Synchronous	Quizzes, Final Exam	Textbook, Lecture Notes
15	Resistivity method	7, 8	Blinded	E-learning	Synchronous	Quizzes, Final Exam	Textbook, Lecture Notes
16	Seismic methods (reflection and refraction) GPR method	7, 8	Blinded	E-learning	Synchronous	Quizzes, 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	15	1, 2	1, 2, 3, 4	Week 3	Face to Face
Quizzes and homework	5	1-10	1-8	Each Chapter	Face to Face
Second Exam	20	3, 4, 5	5, 6, 8	Week 9	Face to Face
Students Presentation	10	1-10	1-8	Week 14	Face to Face
Final Exam	50	1-10	1-8	Week 15	Face to Face

23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, 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 deprive 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, 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 misbehavior:

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:

- Sharma, P. V., 1986, Geophysical methods in geology, 2nd ed., Prentice-Hall, New Jersey.
- Nettleton, L. L., 1976, Gravity and magnetics in oil prospecting, McGraw-Hill, New York.
- Blakely, R. B., 1995, Potential theory in gravity & magnetic applications, Cambridge Univ. Press.

B- Recommended books, materials, and media:

- Dobrin, M. B., 1981, Introduction to geophysical prospecting, 3rd ed., McGraw-Hill, Auckland.

26 Additional information:

NA

Name of the Instructor or the Course Coordinator:	Signature:	Date:
... Dr. Wadah F. Mahmoud.....	.....	.....
Name of the Head of Quality Assurance Committee/ Department	Signature:	Date:
Dr Najel Yaseen.....	.....	.....
Name of the Head of Department	Signature:	Date:
..... Abdalla M. Abu Hamad .....	.....	.....
Name of the Head of Quality Assurance Committee/ School of Science	Signature:	Date:
Prof. Emad A. Abuosba	.....	.....
Name of the Dean or the Director	Signature:	Date:
Prof. Mahmoud I. Jaghoub	.....	.....