The University of Jordan

الجامعة الاردنية

Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2/3/24/2022/2963 05/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	2/3/24/2023
	The Date of the Deans Council Approval Decision	23/01/2023
	Number of Pages	07

1.	Course Title	**Applied Geophysics**
2.	Course Number	**365371**
3.	Credit Hours (Theory, Practical)	2 theoretical & practical
	Contact Hours (Theory, Practical)	1 hr theory, 3 hrs practical
4.	Prerequisites/ Corequisites	0305271
5.	Program Title	Environmental and applied Geology
6.	Program Code	
7.	School/ Center	School of science
8.	Department	Geology
9.	Course Level	3rd Year
10.	Year of Study and Semester (s)	Fall 2025/2026
11.	Other Department(s) Involved in Teaching the Course	none
12.	Main Learning Language	English
13.	Learning Types	■Face to face learning ☐Blended ☐Fully online
14.	Online Platforms(s)	☐Moodle ☐Microsoft Teams
15.	Issuing Date	10/10/2025
16.	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: (None)

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

19. Course Description:

As stated in the approved study plan.
The seismic refraction and reflection, resistivity and magnetic methods in exploration for: oil, gas, groundwater, mineral ores; travel-time equations of refracted waves from subsurface layers of constant velocities; dipping and faulted layers; seismic record sections: computer-processing techniques, analysis and interpretation of seismic reflection data, geophysical and geological interpretation; field and lab applications. Geophysical methods include gravity, magnetic, electric, seismic, geothermal, and integrated geophysical studies.

20. Program Student Outcomes (SO's): (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

1. Apply efficiently basics of mathematics, chemistry, physics, and biology on the Earth processes.
2. Outline, apply and integrate a broad range of fundamental concepts in basic areas of Earth Sciences such as: Minerals, Rocks, Stratigraphy, Structural Geology, Geophysics, Geochemistry, Petroleum Geology, GIS, Hydrogeology, Engineering Geology, and Earth processes

9. Apply professional and ethical responsibility to society.

21. Course Intended Learning Outcomes (CLO's): (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

1	Define terms and concepts related to applied geophysics
2	Identify the term applied geophysics and understand its classification and development.
3	Understanding the theoretical concepts of geophysics in natural science and principles in application to geological studies and basis of geophysics to a specific natural phenomenon,
4	Understanding all different types of geophysical methods and how to select a geophysical method based on the target (oil-gas, minerals, water …etc) and conditions.
5	Understanding the benefit of each individual method on the geophysical surveying field.
6	Understanding problems and field conditions for every geophysical method.
7	Applying practical cases and field measurements for each geophysical method as possible.
8	Being able to handle and interpret geophysical data (practical-field)
9	Applying new technologies in the field of applied geophysics (practical-field)
10	Being able to apply logical, critical, systematic, and innovative thinking in the context of development or implementation of science and technology that concerns and implements the value of humanities in accordance with their area of expertise.

Course CLOs	**The learning levels to be achieved**					
	Remembering	**Understanding**	**Applying**	**Analysing**	**evaluating**	**Creating**
1	√	√				
2	√	√				
3		√				
4		√	√			
5		√	√			
6			√	√		
7			√	√	√	
8			√	√	√	
9			√	√	√	
10			√	√	√	

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program / SO's / Course CLO's	SO (1)	SO (2)	SO (3)	SO (4)	SO (5)	SO (6)	SO (7)	SO (8)	SO (9)
CLO (1)	√	√							
CLO (2)	√	√							
CLO (3)	√	√							√
CLO (4)	√	√							√
CLO (5)	√	√							√
CLO (6)	√	√							√
CLO (7)	√	√							√
CLO (8)	√	√							√
CLO (9)	√	√							√
CLO (10)	√	√							√

23. Topic Outline and Schedule:

Week	Lecture	Topic	CLO/s Linked to the Topic	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1 hr lect. 3 hrs lab.	**Introduction and review of geophysics**	1, 2	Face to face			*Discussion*	*Text Books / lecture nots and YouTube Channels*
2	1 hr lect. 3 hrs lab.	**Approaching the Subsurface**	2, 3	Face to face			*Discussion* *Lab exercise*	*Text Books / lecture nots and YouTube Channels*
3	1 hr lect. 3 hrs lab.	**Geophysics in oil exploration**	4, 5	Face to face			*Discussion* *quiz*	*Text Books / lecture nots and YouTube Channels*
4	1 hr lect. 3 hrs lab.	**Geophysics in mining exploration**		Face to face				
5		**First Exam**						
6	1 hr lect. 3 hrs lab.	**Seismic Exploration: Fundamental Considerations**	5, 6, 7, 8, 9, 10	Face to face			*Discussion* *Home Assignments*	*Text Books / lecture nots*

7	1 hr lect. 3 hrs lab.	Seismology & Earthquake parameters	5, 6, 7, 8, 9, 10	Face to face			*Lab exercises* *Field application*	*and YouTube Channels*
8	1 hr lect. 3 hrs lab.	The Seismic Refraction Method	5, 6, 7, 8, 9, 10	Face to face				
9	1 hr lect. 3 hrs lab.							
10	1 hr lect. 3 hrs lab.							
11		Second Exam						
12	1 hr lect. 3 hrs lab.	The Seismic Reflection Method	5, 6, 7, 8, 9, 10	Face to face			*Discussion* *Lab exercise* *Field application*	*Text Books / lecture nots and YouTube Channels*
13	*1 hr lect.* *3 hrs lab.*							
14	1 hr lect. 3 hrs lab.	Gravity & Magnetic Methods	5, 6, 7, 8, 9, 10	Face to face				*Text Books / lecture nots and YouTube Channels*
15	1 hr lect. 3 hrs lab.	Electrical Resistivity Methods - Electromagnetic Methods	5, 6, 7, 8, 9, 10	Face to face				*Text Books / lecture nots and YouTube Channels*
	Final Exam							

24. Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	CLO/s Linked to the Evaluation activity	Period (Week)	Platform
Midterm exam	**20 %**	1-4	1-5	5	Face to face
Practical Lab exam	**15 %**	6-10	5-10	11	Face to face
Problem sets/lab reports	**15 %**	2-15	1-10	Each week	Face to face
Final exam	**50 %**	5-14	5-10	16	Face to face

25. Course Requirements:

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

The available geophysical instruments will be introduced. Students need a computer (or smartphone) and internet access to watch important videos and applications.

26. Course Policies:

A- Attendance policies: **university regulations**

B- Absences from exams and submitting assignments on time: **university regulations**

C- Health and safety procedures:

For field application, the following safety must be taken in consideration:

1. Suitable cloths depending on weather conditions
2. Every student must take general safety precautions while working, not disturb others and the local community, adhere to lecture etiquette and university regulations, and wear comfortable walking shoes.

D- Honesty policy regarding cheating, plagiarism, misbehavior: **university regulations**

E- Grading policy: **May subjected to changes (depends on the overall results)**

0 - 39	**F**
40 - 44	**D-**
45 – 49	**D**
50 - 54	**D+**
55 – 59	**C-**
60 – 64	**C**
65 – 69	**C+**
70 - 74	**B-**
75 – 79	**B**
80 - 84	**B+**
85 - 89	**A-**
90- 100	**A**

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

internet connection, geophysical instruments, field trips, self-equipment (compasses, hummers, GPS, etc…….).

27. References:

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

1. Burger, H. Robert, Anne F. Sheehan, Craig H. Jones. (2006). **Introduction to applied geophysics: exploring the shallow subsurface**. W. W. Norton & Company, In. 614 pp.
2. Philip Kearey, Michael Brooks, Ian Hill. (2002). **An Introduction to Geophysical Exploration**. THIRD EDITION, Blackwell Science Ltd. 281 pp.
3. John M. R., (2011). **An Introduction to Applied and Environmental Geophysics**, 2nd edt. Ohn Wiley & Sons, Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ,UK.
4. Dobrin, M. B., (1981), **Introduction to geophysical prospecting**, 3rd edt., McGraw-Hill, Auckland.

B- Recommended books, materials, and media:

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

28. Additional information:

- Introduce different geophysical/geological software/s and mobile applications.

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	……..……	……..……