



**The University of Jordan**

**Accreditation & Quality Assurance Center**

**COURSE Syllabus**  
**Petrology**

1	Course title	Petrology
2	Course number	0335231
3	Credit hours (theory, practical)	3 credit hours (theory)
	Contact hours (theory, practical)	3 meetings per week, 1 hour each
4	Prerequisites/co requisites	Mineralogy 0305221/0305212
5	Program title	B.Sc. in Environmental and Applied Geology
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Faculty of Science
9	Department	Department of Geology
10	Level of course	Second Year
11	Year of study and semester (s)	Offered in Spring and Fall semesters. However, ideally a geology student should ne enrolled in this class in the Spring semester of their second year.
12	Final Qualification	B.Sc. in Environmental and Applied Geology
13	Other department (s) involved in teaching the course	none
14	Language of Instruction	English
15	Date of production/revision	Spring 2018

**16. Course Coordinator:**

Office numbers, office hours, phone numbers, and email addresses should be listed.  
 Dr. Ghaleb Jarrar; [jarrargh@ju.edu.jo](mailto:jarrargh@ju.edu.jo)

**17. Other instructors:**

*Office numbers, office hours, phone numbers, and email addresses should be listed.*  
 Dr. Hind Ghanem; [h.ghanem@ju.edu.jo](mailto:h.ghanem@ju.edu.jo)

**18. Course Description:**

*As stated in the approved study plan.*

Igneous rocks: structures, textures, chemistry, magmas, mineralogy and classification; sedimentary rocks: textures, structures, sedimentary processes; classification and description of the main sedimentary rocks; metamorphic rocks: textural and structural aspects, mineral assemblages, metamorphic conditions; At least two days field trip to south Jordan are required.

**19. Course aims and outcomes:**

A- Aims: After having completed this course, the student should be able

This is an essential course in the science of geology. Aside from the atmosphere and hydrosphere, rocks are the stuff of which the Earth is made. Petrology, the study of rocks, therefore occupies a central position among the earth sciences, building upon mineralogy and with strong connections to structural geology and tectonics, sedimentology, geochemistry, and geophysics. This course aims to give students the basic knowledge and tools needed to distinguish between different igneous, sedimentary, and metamorphic rocks, their mineralogy, textures, structures, and petrogenesis.

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

1. To classify igneous rocks based on composition and texture.
2. To demonstrate a basic understanding of phase diagrams and linking them to magma formation and crystallization, and to use them to explain the diversity of magmatic rocks.
3. To demonstrate understanding of magma formation, mixing, and evolution.
4. To recognize the igneous associations based on their composition, and using their chemistry to differentiate between magma series and relate that to their tectonic setting.
5. To be able to recognize sediments, sedimentary rocks, and their environment of deposition based on composition, textures, and large-scale structures as seen in the outcrop.
6. To demonstrate understanding of the chemical weathering processes and the production of the three major classes of sediments and soils.
7. To name metamorphic rocks based on texture, structure and index minerals.
8. To relate metamorphic zones to index minerals and the P-T conditions of metamorphism.
9. To identify protolith of the various metamorphic rocks based on composition.
10. To demonstrate basic understanding of metamorphism types and metamorphic agents and relate them to the proper tectonic settings.

**20. Topic Outline and Schedule:**

Week	Topic	Assigned chapters
28/1 – 1/2	Organization meeting / Introduction / Introduction to Igneous Environments	Introduction + Chapter 1
4/2 – 8/2	Minerals and their Textural Relationships in Igneous Rocks / Chemistry, Physics, and Classification of Igneous Rocks / Volcanism	Chapter 2 Chapter 3 Chapter 4
11/2 – 15/2	Origin of Magmas Through Melting of the Mantle/ Crystallization of Magma	Chapter 5 Chapter 6
18/2 – 22/2	Origin of Magmas Through Melting of the Mantle/ Crystallization of Magma	Chapter 5 Chapter 6
25/10 – 1/3	Origin of Magmas Through Melting of the Mantle/ Crystallization of Magma	Chapter 5 Chapter 6
4/3 – 8/3	Petrology of the Mantle / Igneous Rocks of the Oceanic Ridge	Chapter 7 Chapter 8
11/3 – 15/3	Igneous Rocks of the Convergent Margins / Igneous Rocks of the Continental Lithosphere	Chapter 9 Chapter 10
18/3 – 22/3	The Occurrence of Sedimentary Rocks / Weathering and Soils	Chapter 11 Chapter 12
25/3 – 29/3	Conglomerates and Sandstone / Mudrocks	Chapter 13 Chapter 14
1/4 – 5/4	Limestones and Dolomites / Other Types of Sedimentary Rocks	Chapter 15 Chapter 16
8/4 – 12/4	Introduction to Metamorphism / Metamorphism and the Macroscopic Properties of Metamorphic Rocks	Chapter 17 Chapter 18
15/4 – 19/4	Assemblages, Reactions, and Equilibrium in Metamorphic Rocks	Chapter 19
22/4 – 26/4	Metamorphic Reactions	Chapter 20
29/4 – 3/5	Metamorphism of Mafic and Ultramafic Rocks Metamorphism of Aluminous Clastic Rocks	Chapter 21 Chapter 22
6/5 – 8/5	Metamorphism of Calcareous Rocks	Chapter 23

**21. Teaching Methods and Assignments:**

Development of ILOs is promoted through the following teaching and learning methods:

- ✓ Lectures
- ✓ Home Assignments
- ✓ A one day field trip to Al-Azraq (Tentative time: Late March)
- ✓ A two days field trip to Wadi Araba and East and Northeast of Aqaba. Tentative time: the last week in April

**22. Evaluation Methods and Course Requirements:**

The final grade will consider the student performance in exams, short quizzes, home assignments:

- ✓ Short quizzes (10%).
- ✓ Home assignments (10%).
- ✓ Exams (First 20%, Second 20%, Final 40%).

**23. Course Policies:**

A- Attendance policies:

*Missing 15% of classes (that is > 6 lectures) with or without an officially accepted excuse will result in getting absence fail grade.*

B- Absences from exams and handing in assignments on time:

*Not turning in assignments on time will result in getting a zero grade for that assignment.*

*Missing quizzes and EXAMS will result in getting a zero grade for that quiz or exam. No excuses will be accepted and no makeup exams will be made.*

C- Health and safety procedures:

The safety measures during the field trip will be given in due time.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

The University regulations apply.

E- Grading policy:

The final grade will consider the performance in exams, short quizzes, and home assignments in accordance with the following:

- ✓ Short quizzes (10%).
- ✓ Home assignments (10%).
- ✓ Exams (First 15%, Second 15%, Final 40%).
- ✓ Final grades are given based on a scale that may vary between different semesters. In any case, to pass the class, you must get  $\geq 50$ . Here is a suggested scale for guidance:

0-39	F	40-49	D-
50-53	D	54-57	D+
58-61	C-	62-65	C
66-69	C+	70-73	B-
74-77	B	78-81	B+
82-85	A-	86-100	A

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

E-learning

**24. Required equipment:**

Laptops and data show, and stationary items.

Transportation for the field trip

Field equipment's: hand lenses, hammers, safety tools, etc.

**25. References:**

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

Petrology: Igneous, Sedimentary, and Metamorphic; Third edition; by Harvey Blatt, Robert Tracey, and Brent Owens. Published by W. H. Freeman and Company, 2006.

B- Recommended books, materials, and media: The following link contains extremely helpful information.

Any other petrology book will be helpful

**26. Additional information:**

The Use of mobile phones during the lectures is in all forms strictly forbidden!

Name of Course Coordinator: Dr. Ghaleb Jarrar Signature: ----- Date: -----

Head of curriculum committee/Department: ----- Signature: -----

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

Head of curriculum committee/Faculty: ----- Signature: -----

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

Copy to:

Head of Department  
Assistant Dean for Quality Assurance  
Course File