



مركز الاعتماد
وإضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

Course Name:

Mineralogy

0345221

1	Course title	Mineralogy
2	Course number	0345221
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3 (theory)
4	Prerequisites/corequisites	0335111 as in the program plan A Basic Chemistry Course (101 and/or 102) is needed
5	Program title	BSc. in Environmental and Applied Geology
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Science
9	Department	Geology
10	Level of course	Second Year
11	Year of study and semester (s)	Offered in Spring and Fall semesters, ideally should be taken in the Fall semester for 2 nd year students.
12	Final Qualification	BSc. in Environmental and Applied Geology
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English references and textbook / Lecturing in Arabic and English
15	Date of production/revision	October 2018

16. Course Coordinator:

Dr. Hind Ghanem Office 211 in the Geology Building. Phone: 5355000 (22281). h.ghanem@ju.edu.jo Office hours: Sunday, Tuesday, Thursday 12-13 .

17. Other instructors:

NA

18. Course Description:

This is an essential course in the science of geology. Virtually all aspects of geology are fundamentally tied to mineralogy, from geochemistry to geophysics. The major goal of this course is to give you access to the information that minerals can provide about Earth processes and Earth history. In this course, you will study the different mineral groups essentially forming the Earth, their chemistry, their crystal structures (how their atoms are arranged and why they are the way they are), their properties, their formation, their classification and how they respond to changes in temperature, pressure, and environment.

19. Course aims and outcomes:

A- Aims: *To provide the student with the knowledge of crystals and crystallization; crystal and mineral chemistry; physical and optical properties of minerals; different mineral groups with emphasis on rock-forming minerals and economic minerals and will be ready to move to the next level which is studying rocks (petrology).*

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

1. Identify materials classified as minerals and the conditions required for that.
2. Demonstrate a basic understanding of crystallography. Enumerate and describe the crystal systems in terms of both symmetry and unit-cell metrics, recognize symmetry elements in well-formed natural crystals or model and sketches.
3. Demonstrate understanding of the fundamental ideas that govern the arrangement of atoms into a crystalline structure (chemical bonding, atomic size, coordination number, polymerization of polyhedra, bond strength and bond valence, stability, etc.).
4. Identify the mechanisms and implications of various mineralogical phenomena and properties, including solid solution, exsolution, polymorphism, atomic ordering, color, twinning; etc.
5. Recognize and understand the interrelationships among crystallography, composition, and the physical properties of minerals.
6. Determine which parameters control what minerals occur in specific environments. (Geologic environments of mineral formation, geochemistry, phase equilibria, phase diagrams, chemical reactions, phase transitions, experimental mineralogy and petrology).
7. Identify important instrumental and analytical methods used in mineralogy and recognize their limitations. To process minerals chemical data and use proper graphical representation.
8. Identify common mineral groups particularly silicates and demonstrate a basic understanding of their structures, physical properties, chemical composition, and occurrence or environments of formation.
9. Recognize mineral properties that make them useful for certain uses (hardness, chemical resistance, resistance to high temperatures, ability to remove pollutants from liquids).

20. Topic Outline and Schedule:

<i>Dates</i>	<i>Number of Lectures</i>	<i>Topic</i>	<i>Assigned Reading</i>
9/9	1	Organization meeting	Course Syllabus
Tuesday 11/9/2018, Hijri New Year Holiday – No classes			
13/9	1	Introduction	Chapter 1
16/9 – 23/9	4	Crystallography	Chapter 2
25/9 – 30/9	3	Crystal Chemistry	Chapter 3
2/10 – 9/10	4	Crystal Structure	Chapter 4
11/10 – 21/10	5	Mineral Growth	Chapter 5

<i>Sunday 21/10/2018, First Exam (chapters 1-4) at 12:00 pm</i>			
23/10 – 28/10	3	Physical Properties of Minerals	Chapter 6
30/10	1	Chemical Analysis of Minerals	Chapter 9
1/11 – 4/11	2	Silicates	Chapter 11
6/11 – 11/11	3	Framework Silicates	Chapter 12
13/11 – 18/11	3	Sheet Silicates	Chapter 13
<i>Tuesday 20/11/2018, Al-Mawlid Annabawi Holiday – No classes</i>			
<i>Sunday 25/11/2018, Second Exam (chapters 5, 6, 9, and 11) at 12:00 pm</i>			
22/11 – 27/11	3	Chain Silicates	Chapter 14
29/11	1	Disilicates and Ring Silicates	Chapter 15
2/12 – 4/12	2	Orthosilicates	Chapter 16
6/12 – 9/12	2	Carbonates, Sulfates, Phosphates, Tungstates, Molybdates, and Borates	Chapter 17
11/12 – 13/12	2	Oxides, Hydroxides, and Halides	Chapter 18
16/12	1	Sulfides and Related Minerals	Chapter 19
18/12	1	Native Elements	Chapter 20
<i>The final exam: to be decided by the registration unit</i>			

21. Teaching Methods and Assignments:

Material is presented as PowerPoint presentation along with explanation and illustrations on the whiteboard. Students have the assigned textbook as the main reference, and they should take notes during class.

22. Evaluation Methods and Course Requirements:

- Home assignments (10%).
- Exams (First 25%, Second 25%, 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 ≥ 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+	70-74 B-
75-79 B	80-84 B+
85-89 A-	90-100 A

23. Course Policies:

A- Attendance policies: Missing more than six lectures with or without an officially accepted excuse will result in getting absence fail grade and the student will need to re-enrol in the lab when it is next available.

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

- Not turning in assignments on time will result in getting a zero grade of that assignment.
- Missing quizzes in class time will result in getting a zero grade of that quiz.
- Missing exams with no excuse results in getting a zero grade of that exam. ONLY and ONLY if the student shows a proof of an emergency and compelling accepted excuse, a makeup exam will be given. But be warned that makeup exams are at least 200% harder than regular exams so try your best not to miss an exam.

C- Health and safety procedures: NA**D- Honesty policy regarding cheating, plagiarism, misbehavior:**

The regulations of the university will be applied.

E- Grading policy: See section 22.**F- Available university services that support achievement in the course:** NA**24. Required equipment:**

Some molecular models for teaching, mineral specimens, a classroom equipped with a data show projector.

25. References:**A- Required book (s), assigned reading and audio-visuals:**

Required textbook: Introduction to Mineralogy, (second or third edition), by W. Nesse. Oxford University Press

B- Recommended books, materials, and media:

The Manual of Mineral Science (editions 21 or 22), by C. Klein, John Wiley and Sons.

26. Additional information:

NA

Name of Course Coordinator: **Hind Ghanem** Signature: **Hind Ghanem** Date: **9/9/2018** Head

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

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

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

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

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