

1	Course title	Clay Minerals	
2	Course number	0305722	
3	Credit hours	3	
	Contact hours (theory, practical)	3, theory	
4	Prerequisites/corequisites	-	
5	Program title	M.Sc. in Geology	
6	Program code	-	
7	Awarding institution	-	
8	School	School of Science	
9	Department	Geology	
10	Course level		
11	Year of study and semester (s)	Fall or Spring semesters	
12	Other department (s) involved in teaching the course	None	
13	Main teaching language	English and Arabic	
14	Delivery method	✓ Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	Online platforms(s)	✓ Moodle ✓ Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others.....	
16	Issuing/Revision Date	Summer 2024	

17 Course Coordinator:

Name: Hind Ghanem
Contact hours:
Office number: Geology Building Phone number: 22281 Email: h.ghanem@ju.edu.jo

18 Other instructors: NONE

19 Course Description:

The aim of this course is to introduce the student to the world of Clay Minerals. The identification and characterization of minerals present in clay using different techniques and the interpretation of clay mineralogical data in combination with chemical analyses. The physical and chemical properties of clay minerals that are important with regard to clay minerals applications in environmental and industrial applications and the interaction of clays and human health.

20 Course aims and outcomes:

A- Aims:

- The identification and characterization of minerals present in clay by using different techniques available at JU (XRD and SEM) and the interpretation of clay mineralogical data in combination with chemical analyses. The physical and chemical properties of clay minerals that are important with regard to the environment and variable industrial and medical applications are discussed comprehensively.
- To help students manipulate and interpret quantitative data related to clay mineralogy to draw appropriate conclusions.
- To help students engage in scientific reasoning through the use of theories, hypotheses, data, and conclusions in the field of clay mineralogy.

B- B- Students Learning Outcomes (SLOs): Upon successful completion of this course, students will be able to:

1. To demonstrate understanding of the structure, nomenclature, and occurrences of clay minerals
2. To be familiar with sample preparation techniques for clay minerals.
3. To identify and characterize of clay minerals (kaolinite, illite, montmorillonite, vermiculite, chlorite) and associated minerals (silica minerals, carbonates, Fe-oxides/hydroxides, sulfides, salts, etc.).
4. To demonstrate basic understanding of the identification of mix-layered clay minerals.
5. To understand and characterize the transformation processes in clay minerals and reactions on clay mineral surfaces.
6. To calculate the structural formulas of clay minerals.
7. To understand the clay minerals applications in environmental and industrial applications and the interaction of clays and human health.

21. Topic Outline and Schedule:

TBD

22 Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	SLO	Period (Week)
Midterm Exam	30	TBD		End of eighth week
Home Assignments	10	TBD		Weekly
Project and presentation	20	TBD		Term-long project due at the end of the semester
Final Exam	40	TBD		End of semester

23 Course Requirements

Students should have a computer, internet connection, webcam, active account on Microsoft-teams. Students should have access to XRD laboratory and SEM laboratory.

24 Course Policies:

- A- Attendance policies:
as in school regulations.
- B- Absences from exams and submitting assignments on time:
as in school regulations.
- C- Health and safety procedures: as in school regulations.
- D- Honesty policy regarding cheating, plagiarism, misbehavior: as in school regulations.
- E- Grading policy:
 - *Project 20%*
 - *Home Assignments 10%*
 - *Midterm Exam 30%*
 - *Final Exam 40%*
- F- Available university services that support achievement in the course: NA.

25 References:

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

Required textbook: no specific required textbook.

C- Recommended books, materials, and media:

- Crystal structures of clay minerals and their X-ray identification", G.W. Brindley & G.Brown, 1980
- Chemistry of clays and clay minerals", A.C.D. Newman, 1987
- Clays, A. Meunier, 2005
- Assigned readings for different topics. See available resources on E-learning
- Any other textbook in Mineralogy and Clay Minerals topics is recommended.

26 Additional information:

NA

Name of Course Coordinator: -----	Signature: -----
---- Date: -----	
Head of Curriculum Committee/Department: -----	Signature: -----
Head of Department: -----	Signature: -----
Head of Curriculum Committee/Faculty: -----	Signature: -----
Dean: -----	Signature: -----