



The University of Jordan
Accreditation & Quality Assurance Center

COURSE

1	Course title	Diagnosis and analytical technology of Archaeological Materials
2	Course number	2632314
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	-
5	Program title	B.A degree in Cultural Resources Management and Conservation
6	Program code	20
7	Awarding institution	The University of Jordan
8	Faculty	Faculty of Archaeology and Tourism
9	Department	Cultural Resources Management and Conservation
10	Level of course	3
11	Year of study and semester (s)	2016 / 1 st
12	Final Qualification	B. A
13	Other department (s) involved in teaching the course	
14	Language of Instruction	Arabic / English
15	Date of production/revision	4/ 09/ 2016

16. Course Coordinator:

Office numbers, office hours, phone numbers, and email addresses should be listed.

Mustafa Al-Naddaf
naddaf@yu.edu.jo
 0790554398

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.

Mustafa Al-Naddaf
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 0790554398

18. Course Description:

As stated in the approved study plan.

The course includes teaching different physical and chemical methods of examining and explaining various archaeological artifacts, and the interpretation of the results. In addition, the course includes the benefits of analyzing archaeological materials, and the processes of sampling and preparing procedures of different methods of analysis. Practical work is carried out in the Laboratory

1. 19. Course aims and outcomes:

2.

A- Aims:

- Highlighting the importance of archaeological analysis
- Showing how to apply traditional chemical techniques to analyze archaeological materials and what are the limitations and advantages of these techniques
- Pointing out the use of microscopes to analyze archaeological materials
- Highlighting the concept of spectroscopy
- Introducing the students to different techniques of physical methods, their basic principle, experimental procedures, their advantages and limitations
- Highlighting the applications of different techniques.

B- Intended Learning Outcomes (ILOs):

Upon completion of the course, the student must demonstrate the knowledge and the ability to:

- Show how to prepare the archaeological report of analysis
- Choose the suitable method to analyze material under research
- Know the advantages and limitations of various techniques
- Prepare the sample for analysis depending on the method of analysis

20. Topic Outline and Schedule:

3.

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
-Importance of analysis of archaeological materials -Revision of some important properties of archaeological materials	1	M. Al-Naddaf	- Introducing the students to the importance of the analysis of archaeological materials.	-	A handbook compiled from the different resources
-Destructive and non-destructive testing -Information required in a report of analysis of archaeological materials. -Traditional Methods of Examination	2	M. Al-Naddaf	Enabling the students to understand nature of damage that can the analysis cause.	Lab discussion. Presenting hand specimen.	A handbook compiled from the different resources
Petrological microscopy. Experimental procedures Principles of mineral and rock identification Stone artefacts Pottery Lab	3	M. Al-Naddaf	Enabling the students to understand the principles of optical microscopy and its importance in analyzing archaeological materials.	Lab discussion.	A handbook compiled from the different resources
Metallographic microscopy Experimental procedure non-ferrous metals and alloys. . Iron and steel. Lab	4	M. Al-Naddaf	Enabling the students to understand the principles of metallurgical microscopy and its importance in analyzing archaeological metallic materials.	Lab discussion.	A handbook compiled from the different resources
-Electron microscopy -Transmission electron microscope. . -Scanning electron microscope. applications -Lab	5	M. Al-Naddaf	Enabling the students to understand the principles of electron	Lab discussion.	A handbook compiled from the different resources

			microscopy and its importance in analyzing archaeological materials.		
Radiography. Principle Applications	6	M. Al-Nadfa	Enabling the students to understand the principles of radiography and its importance in analyzing archaeological materials.	Lab discussion.	A handbook compiled from the different resources
Physical methods of analysis. vs. chemical methods Groups of physical methods Spectroscopy Optical emission spectrometry. . Experimental procedures. Advantages and limitations.	7	M. Al-Nadfa	Enabling the students to understand the principles of physical methods of analysis and their importance in analyzing archaeological materials.	-	A handbook compiled from the different resources
Atomic absorption spectrometry Experimental procedures. Advantages and limitations. Lab	8	M. Al-Nadfa	Enabling the students to know how the chemical composition of archaeological materials can be determined using AAS.	Lab discussion.	A handbook compiled from the different resources
X-ray fluorescence spectrometry Experimental procedures. Advantages and limitations Lab.	9	M. Al-Nadfa	Enabling the students to know how the chemical composition of archaeological materials can be determined using XRF.	Lab discussion.	A handbook compiled from the different resources

Electron probe microanalyser Experimental procedures. Advantages and limitations. X-ray diffraction Experimental procedures. Advantages and limitations. Lab	10	M. Al-Naddaf	Enabling the students to know how the chemical composition of archaeological materials can be determined using EMPA.	Lab discussion.	A handbook compiled from the different resources
Infra-red absorption spectrometry Experimental procedures. Advantages and limitations. Lab	11	M. Al-Naddaf	-Enabling the students to know how the chemical composition of archaeological materials can be determined using FTIR. -	Lab discussion.	A handbook compiled from the different resources
Thermal analysis Differential thermal analysis Thermogravimetric analysis. Thermal expansion measurements	12	M. Al-Naddaf	Enabling the students to know how the thermal properties of materials can be determined.	Lab discussion.	A handbook compiled from the different resources
Isotopic Analysis Experimental procedures. Advantages and limitations. Experimental procedures. Advantages and limitations. Physical Properties of materials	13	M. Al-Naddaf	Introducing the students to the importance of Isotopes analysis in the field of archaeology	Lab discussion.	
<u>Part 4: Analysis of organic materials</u> Chromatography	14	M. Al-Naddaf	Enabling the students to know how the composition of organic materials can be determined	Lab discussion.	A handbook compiled from the different resources



21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:
All the lectures will be presented using powerpoint presentation.
Some practical sessions will be held at the lab.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:
The evaluation system based on 3 exams and some assignments.

23. Course Policies:

A- Attendance policies:

Attendance of all lectures is obligatory; in any case absence should not exceed 15% of the contact hours.

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

Make up exam can be held only in emergency cases and the approval of the dean is a must.

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehavior:

The regulations of the University will be applied

E- Grading policy:

First exam: 20%

Second exam: 20%

Assignments: 10 %

Final exam: 50%

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

24. Required equipment:

A fully equipped conservation lab.

25. References:

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

A handbook compiled from the following resources:

Material Characterization Tests: For traditional techniques of analysis

Methods of physical examination in Archaeology /

Tite, M. S.

Publication: Seminar, London: 1972.

Current scientific techniques in archaeology /

Parkes, P.A.

Publication: Croom Helm, London: 1986.

Archaeological Chemistry : a sourcebook on the applications of chemistry to archaeology /
chemical analysis

Goffer, Zvi

Publisher: Wiley, New York: 1980.

B- Recommended books, materials, and media:

Material Characterization Tests: For traditional techniques of analysis

Methods of physical examination in Archaeology /

Tite, M. S.

Publication: Seminar, London: 1972.

Current scientific techniques in archaeology /

Parkes, P.A.

Publication: Croom Helm, London: 1986.

Archaeological Chemistry : a sourcebook on the applications of chemistry to archaeology /
chemical analysis

Goffer, Zvi

Publisher: Wiley, New York: 1980.

26. Additional information:

A facebook group will be established in order to facilitate communication among the students and the instructor. References and media will be supplied via this group.

Name of Course Coordinator: **M. Al-Naddaf** Signature: ----- Date:

4.09.2016

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

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

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

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

Assurance

Copy to:
Head of Department
Assistant Dean for Quality

Course File