

## Course Syllabus

1	<b>Course title</b>	X-ray Crystallography and Structure Determination	
2	<b>Course number</b>	0303722	
3	<b>Credit hours</b>	3 (theory)	
	<b>Contact hours (theory, practical)</b>	3 hrs/week (theory)	
4	<b>Prerequisites/corequisites</b>	Chemical Applications of Group Theory 0303722	
5	<b>Program title</b>	M.Sc. Chemistry	
6	<b>Program code</b>	0303	
7	<b>Awarding institution</b>	The University of Jordan	
8	<b>School</b>	Science	
9	<b>Department</b>	Chemistry	
10	<b>Course level</b>	Master students (including PhD students)	
11	<b>Year of study and semester(s)</b>	Summer semester 2023/2024	
12	<b>Other department(s) involved in teaching the course</b>	None	
13	<b>Main teaching language</b>	English	
14	<b>Delivery method</b>	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online	
15	<b>Online platforms(s)</b>	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom	
		<input type="checkbox"/> Others.....	
16	<b>Issuing/Revision Date</b>	03-11-2023	

**17 Course Coordinator:**

Name: Prof. Dr. Murad A. AlDamen	Contact hours: 8:00-10:00 Mon. Wed.
Office number: Chemistry 2 <sup>nd</sup> floor	Phone number: N/A
Email: <a href="mailto:maldamen@ju.edu.jo">maldamen@ju.edu.jo</a>	

**18 Other instructors:****19 Course Description:**

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## 20 Course aims and outcomes

### A- Aims:

The aim of this MSc course is to give students a broad view of the subject of crystallography. The course provides a basic grounding and the concepts of crystal structures and symmetry, the physics of scattering and diffraction theory, experimental diffraction (single crystals). Also, it explores the analysis of single-crystal data and students will practice the solving of some crystal structures.

### B- Students Learning Outcomes (SLOs):

The program's student outcomes must fulfill the above ABET student outcomes. You can add new outcomes for your program, but all the six ABET-outcomes must be included.

SO1. To remember the solid-state chemistry taught in previous BsC courses.

SO2. To understand concept such as lattice, point and space groups.

SO3. To apply Bragg's Law and explain its the relation to crystal structure.

SO4. To Identify and describe different diffraction methods.

SO5. To Interpret and assign X-ray and electron diffraction patterns.

SO6. To solve some crystal structures of simple compounds.

## 21. Topic Outline and Schedule:

Weeks	Lecture	Topic	Intended Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1	Introduction to solid state	1	Face to face			Exam	Different resources
2	2	X-ray diffraction	1	Face to face			Exam	Different resources

3	3	Crystal Systems and Geometry	1	Face to face			Exam	Different resources
4-5	4	Space Groups and Equivalent Positions	1	Face to face			Exam	Different resources
6-8	5	Diffraction and crystal structures	1	Face to face			Exam	Different resources
9-10	6	Determination of Atomic Positions	1	Face to face			Exam	Different resources
11-12	7	Practical work	1	Face to face			Practical	Different resources

## 22 Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Quiz	20	As per Sec. 21 above		Week 8	
Midterm	30	As per Sec. 21 above		Week 12	
Final Exam	50	As per Sec. 21 above		TBD	

## 23 Course Requirements

(Scientific calculator (Smart phones are not allowed) and writing utensils



## 24 Course Policies:

A- Attendance policies: All students are expected to follow the of attendance policies of the University of Jordan, absences exceeding 15% of total number of class meeting (6 hour classes) will result in F grade or course drop.

B- Absences from exams and handing in assignments on time: University rules and regulations regarding make-up exams.

C- Health and safety procedures: N/A

D- Honesty policy regarding cheating, plagiarism, misbehaviour: University rules and regulations.

E- Grading policy: University rules and regulations

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

## 25 References:

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

1. Introduction to Crystallography, by Donald E. Sands.
2. X-ray Structure Determination, by George H. Stout and Lyle H. Jensen.
3. Crystallography and its applications, by L. S. D. Glasser

Recommended books, materials, and media:

The International Tables for X-ray Crystallography. Other reference textbooks by Bunn, Buerger, Glasser, Wheatley, and others in the field may be found in the library

## 26 Additional information:



مركز الاعتماد  
و ضمان الجودة  
ACCREDITATION & QUALITY ASSURANCE CENTER

Name of Course Coordinator: Dr. Hazem Amarne  
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Date: 25/08/2023

Signature: -----

Head of Curriculum Committee/Department: ----- Signature: -----  
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Head of Department: ----- Signature: -----  
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Head of Curriculum Committee/Faculty: ----- Signature: -----  
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Dean: ----- Signature: -----  
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