Jordan University of Science and Technology

Faculty of Science & Arts

Physics Department

PHY471 Solid State Physics
First Semester 2022-2023

Course Catalog
3 Credit Hours. This course is designed to introduce the structure of solid materials and methods of structure determination, the chemical bonds, thermal properties of materials, and electrical and electronic properties of materials.

Text Book	
Title	Introduction to Solid State Physics
Author(s)	C. Kittel
Edition	8th Edition
Short Name	solid State Physics
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
SSP	Solid State Physics	Aschcroft and Mermin	1st Edition	

Instructor	
Name	**Prof. Mohammad-Khair Qaseer**
Office Location	PH4 L-1
Office Hours	Sun : 11:00 - 12:30 Mon : 09:00 - 10:00 Tue : 10:30 - 12:30 Wed : 08:30 - 10:00
Email	qaseer@just.edu.jo

Class Schedule & Room

Section 1:
Lecture Time: Mon, Wed : 10:00 - 11:30
Room: NG41

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
923511	PHY351 Quantum Mechanics(1)	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2	Chapter 1: Crystal Structure	
Weeks 3, 4	Chapter 2: Reciprocal Lattice	
Weeks 5, 6	Chapter 3: Crystal Binding	
Weeks 7, 8	Chapter 4: Crystal Vibrations (Phonon 1)	
Weeks 9, 10	Chapter 5: Thermal Properties (Phonon 2)	
Weeks 11, 12	Chapter 6: Free Electron Fermi Gas	
Weeks 13, 14	Chapter 7: Energy Bands	

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
1) Understanding main types of crystals [31]	10%	First Exam
2) Understanding methods of crystal structure determination methods and ability to identify crystal structures [31]	10%	First Exam
3) Understanding types of crystal binding [31]	10%	Second Exam
4) Understanding vibrations in crystals and the thermal properties of solids [31]	10%	Second Exam
5) Understanding electrical properties of metals [31]	20%	
6) Having a brief knowledge of how energy gap exists [31]	20%	
Homework and quizzes [11]	20%	

Relationship to Program Student Outcomes (Out of 100%)					
1	2	3	4	5	6
100					

Evaluation

Assessment Tool	Weight
First Exam	20%
Second Exam	20%

Policy	
Solid State Physics	This course is designed for students who completed more than 90% of their B.Sc physics courses. Therefore, homework assignments will be mandatory for students to pass. At least 6 assignments will be given. Moreover, quizzes will be an essential part for student evaluations.

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