

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Solid State Physics(1)
Course number	PHYS3318
Faculty	
Department	
Course type	Major Needs
Course level	3
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - The course introduces the principles of the structure and physics of material as an introductory course for solid state physics

Intended Learning Outcomes

Knowledge and Understanding	<ul style="list-style-type: none"> * Understand the crystal structure, thermal properties and magnetic properties of materials * Recognize the applications of X-ray crystallography * Create theoretical dealing of the topic under investigation
Intellectual Skills	<ul style="list-style-type: none"> * Compare between different types of Crystal imperfections
Professional Skills	<ul style="list-style-type: none"> * Use the physical knowledge to analyze a suitable technique to solve problems * Solve some physical problems helping in understanding the course parts
General Skill	<ul style="list-style-type: none"> * use the internet/electronic resources to obtain subject specific information, - use a number of computer packages to present information * Working with others: work with other as a part of a team to collect data and/or to produce reports and presentations * Prpblem solving: - Regular problem exercises and example will give students the chance to develop their theoretical understanding and problem * Communication: Students will have write reports and give oral presentation

Course Contents

<ol style="list-style-type: none"> 1 - Structure of solids: Crystalline and amorphous 2 - X-ray diffraction 3 - Applications of X-ray crystallography 4 - Types of crystal imperfections 5 - Lattice vibration 6 - Thermal properties: classical Einstein and Debby theories of heat capacity 7 - Thermal conductivity and thermal expansion

Teaching and Learning Methods

- 1 - lecture using Power Point presentations
- 2 - practical sections
- 3 - independent reading throughout basic text books and research papers
- 4 - Data show – computer – blackboard
- 5 - Direct Instruction: lecture, reading, in class research, problem sets, presentations, and guest speakers

Teaching and Learning Methods for the Disabled Students

- 1 - Student oral presentations

Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
First mid-term exam	Mid-term	40
Attendance and discussion		5
Homework and project reports	End-term	5
Final exam	End-term	50

Books and References

Course note	Lecturer private notes
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Essential books	M. A. Omar Elementary Solid State Physics: Principles and Applications, 1994
Recommended books	Introduction to solid state physics", C.Kittel, John Wiley& son,Inc
	Introduction to solids", L.V Azaroff, McGrew- Hill
	Solid state physics ", A.J. Dekker, MacMillan Press Ltd
Other References (Periodical, web sites, etc.)	Imare and ASME web sites
	Power & Energy, Solar Today and ASME periodicals
	http://hyperphysics.phy-astr.gsu.edu/hbase/heacon.html
	Scientific.net