



Course Specification

(Bachelor)

Course Title: Solid State Physics Lab

Course Code: PHYS 0482

Program: Bachelor of Science in Physics (BS)

Department: Physics

College: College of Science Al-Zulfi

Institution: Majmaah University

Version: 1

Last Revision Date: 30/12/2024



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4
C. Course Content	5
D. Students Assessment Activities	5
E. Learning Resources and Facilities	6
F. Assessment of Course Quality	7
G. Specification Approval	7



A. General information about the course:

1. Course Identification

1. Credit hours: 2 (0+4+0)

2. Course type

A. University College Department Track Others

B. Required Elective

3. Level/year at which this course is offered: (Level 7, 4st year)

4. Course General Description:

To study the basic laws of solid state physics, Bragg's law, detection of X-radiation using an air-filled ionization chamber, temperature dependency of a semi-conductor resistor, Seebeck coefficient, Peltier coefficient, Thomson coefficient, etc., experimentally.

5. Pre-requirements for this course (if any):

PHYS 0381

6. Co-requisites for this course (if any):

Nil

7. Course Main Objective(s):

This course aims to provide the fundamentals of experimentation of Solid State Physics.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	64	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		





3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	
2.	Laboratory/Studio	64
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		64

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Assurance of the basic knowledge of the main physical phenomenon for solid state courses.	k1	<ul style="list-style-type: none"> Lab. Lectures Traditional lab. 	<ul style="list-style-type: none"> Writing reports Presentations
1.2	Gather experimental data of experiments.	k1	<ul style="list-style-type: none"> Lab. Lectures Traditional lab. 	<ul style="list-style-type: none"> Writing reports Presentations
...				
2.0	Skills			
2.1	Develop and implement experimental procedures.	S1	<ul style="list-style-type: none"> Presentations Small group supervisions 	<ul style="list-style-type: none"> Homework Observation Lab Report
2.2	Select an appropriate instrument to experiment.	S1	<ul style="list-style-type: none"> Presentations Small group supervisions 	<ul style="list-style-type: none"> Homework Observation Lab Report
...				
3.0	Values, autonomy, and responsibility			
3.1	Work in a group and learn time management.	V1	<ul style="list-style-type: none"> Presentations Small group supervisions 	<ul style="list-style-type: none"> Homework Observation Lab Report
3.2	Choose the appropriate scale to analyze data and	V1	<ul style="list-style-type: none"> Presentations Small group supervisions 	<ul style="list-style-type: none"> Home work Observation Lab Report





Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	calculate the unknown parameters.			
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Description of theoretical Phenomenon with Overview of Solid State Physics Lab experiments	4
2.	Thermoelectric effect in semiconductors (calculation of Seebeck, Peltier and Thomson coefficients)	4
3.	Thermoelectric effect in semiconductors (calculation of Seebeck, Peltier and Thomson coefficients)	4
4.	Solar Cells experiment	4
5.	Determination of the thermal coefficient of a noble metal (platinum) by computer	4
6.	Determination of the thermal coefficient of a noble metal (platinum) by computer	4
7.	First exam	4
8.	X-ray Diffraction and calculation of Lattice parameters in NaCl single-crystal	4
9.	X-ray Diffraction and calculation of Lattice parameters in NaCl single-crystal	4
10.	X-ray ionization chamber	4
11.	X-ray ionization chamber	4
12.	Second exam	4
13.	Hall Effect	4
14.	Hall Effect	4
15.	Final revision	4
16.	Final Exam Preparation	4
Total		64

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First exam	7	15%





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
2.	Second exam	12	15%
3.	Final exam	End of the semester	40%
4.	Lab Reports/Home Work	End of experiments	10%
5.	Exp. Performance	Every lab	20 %
6.	Presentation and discussions	Every week	20 %
7.	Team Group	2 times/ semester	20 %
8.	Total		100 %

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Kittel, Charles. Introduction to Solid State Physics. 8th ed. New York, NY: John Wiley & Sons, 2004. ISBN: 9780471415268.
Supportive References	<ul style="list-style-type: none"> Experiment manual. www.kotobarabia.com
Electronic Materials	<ul style="list-style-type: none"> Elsevier (www.sciencedirect.com) Springerlink (www.springerlink.com) Institute of physics (www.iop.org) John Wiley (www.wiley.com) http://faculty.mu.edu.sa/mgaafar/ Hazemsakeek.com http://hyperphysics.phy-astr.gsu.edu/hbase/hph.html
Other Learning Materials	<ul style="list-style-type: none"> Excel software for drawing graphs in the lab. MS Office for writing reports and presentations.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> 1 classroom with a capacity of a maximum of 25 students is required. (available). 1 laboratory with a capacity of a maximum of 14 students is required (available).
Technology equipment (projector, smart board, software)	<ul style="list-style-type: none"> The classroom is equipped with a smart board, its running software 'active Inspire', and an internet connection.





Items	Resources
	<ul style="list-style-type: none"> The laboratory is equipped with a smart board, its running software 'active inspire', and internet connection.
Other equipment (depending on the nature of the specialty)	AV outlets for both classroom and laboratory. Library, Seminar Room, and Wi-Fi internet connections.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Teachers	Teacher self-assessments
Effectiveness of Students assessment	Students	Student surveys
Quality of learning resources	Quality committee	Alignment with learning outcomes
The extent to which CLOs have been achieved	Administrators	Student performance data
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	16
DATE	30/12/2024

