



SYLLABUS

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Co-requisites	Pre-requisites	Course Level	Language
PHY	481	Solid State Physics and Modern Physics Lab.	2	0	4	0	4	PHY 461	PHY 382	7	English

A. Course Description

This course provides laboratory work at the advanced undergraduate level. The course emphasizes experimental techniques, procedures and formal report writing. Laboratory experiments reinforce or extend the work of the lecture portion of the course. The course includes experimental description of crystal and electronic structure, lattice dynamics, and optical properties of different materials.

B. Course Outcomes

At the end of this course the student will be able to:

1. Observe and analyze physical data relevant to some of the experiments in solid state physics and modern physics.
2. Provide students with a thorough understanding of the basic concepts of physics and the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis.
3. Develop the student's mathematical ability to manipulate formulae and derive correct numerical solutions that can be measured in the real world.
4. Instruct students in the competent use of laboratory equipment to collect and record data, apply relevant mathematical models and perform required computations, and present the derived results as an application of a measured observation of the physical world.

C. References

Required Textbook

- Laboratory Manual supplied by the Department of Physics.
- Laboratory Manual is available at the website of the Department of Physics.

Course Website: <http://www.imamm.org/>

D. Topics Outline

1. **Introduction** (Contact hours: 4).
2. **Experiment 1: Diffraction of electron in a polycrystalline lattice (Debye-Scherrer diffraction)** (Contact hours: 4).
3. **Experiment 2: Plank's constant (h)** (Contact hours: 4).
4. **Experiment 3: Bragg reflection: diffraction of x-rays at a monocrystal** (Contact hours: 4).
5. **Experiment 4: Investigating the Hall effect in silver** (Contact hours: 4).
6. **Experiment 5: Recording the current-voltage characteristics of a CdS photoresistor** (Contact hours: 4).
7. **Experiment 6: Determination of the specific charge of the electron** (Contact hours: 4).
8. **Experiment 7: Electron spin resonance (ESR)** (Contact hours: 4).
9. **Revision** (Contact hours: 4).



E. Office Hours

Office hours give students the opportunity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in class.

F. Exams & Grading System

The semi-official dates of the exams for this course are:

- **Midterm 1:** 6th or 7th week.
- **Midterm 2:** 11th or 12th week.
- **Quizzes, Lab. reports & Homeworks:** During the semester.
- **Final Exam:** 16th week.

Your course grade will be based on your semester work as follows:

Midterm 1: 7.5 %	Midterm 2: 7.5 %	Final Exam: 50 %
Quizzes, Lab. reports, Homework, Attendance & Participation: 35 %		

The grading distribution:

A+	A	B+	B	C+	C	D+	D	F
[95, 100]	[90, 95)	[85, 90)	[80, 85)	[75, 80)	[70, 75)	[65, 70)	[60, 65)	[0, 60)

G. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. (“Immediate family” is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

[Executive Rules for Study Regulations and Exams](http://goo.gl/ykm7t3)

goo.gl/ykm7t3

