



## SYLLABUS

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Co-requisites	Pre-requisites	Course Level	Language
PHY	281	Thermal Physics & Mechanics	2	0	3	0	2.5	PHY 230	PHY 101	3	English

### A. Course Description

This course is designed to aid students in the development of core practical skills in Physics. The course includes a series of experiments exploring fundamental concepts in thermal physics and mechanics. Every class will have a short lecture introducing the procedures, concepts, formulas and instructions relevant to the experiment. The lecture will also cover what is expected in the lab-report; don't be late. Attendance and participation is mandatory. Experiments will usually be performed in groups, but each student will turn in an individual lab report.

### 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 thermal physics and mechanics.
2. Use laboratory equipment to demonstrate certain aspects of thermal physics and mechanics.
3. 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.
4. Develop the student's mathematical ability to manipulate formulae and derive correct numerical solutions that can be measured in the real world.
5. 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. **Experiment 1:** Inscription in the lab and distribution of the group (Contact hours: 3).
2. **Experiment 2:** Path-time diagrams of rotational motion: Measurements the angular velocity, angular acceleration (Contact hours: 3).
3. **Experiment 3:** Conservation of Energy by using Maxwell's Wheel (Contact hours: 3).
4. **Experiment 4:** Laws of Gyroscopes / 3-axis gyroscope (Contact hours: 3).
5. **Experiment 5:** Damped and forced oscillations – Pohl's torsional pendulum: part 1 (Contact hours: 3).



6. **Experiment 6:** Damped and forced oscillations – Pohl's torsional pendulum: part 2 (Contact hours: 3).
7. **Experiment 7:** Determining the Specific heat capacity of solids (Contact hours: 3).
8. **Experiment 8:** The thermal expansion of solid bodies: Measuring the linear thermal expansion (Contact hours: 3).
9. **Experiment 9:** Boyle's law: verification of Boyle's law, and measuring the atmospheric pressure (Contact hours: 3).
10. **Experiment 10:** Determining the volumetric expansion coefficient of water as liquid (Contact hours: 3).
11. **Experiment 11:** The latent heat of water (Contact hours: 3).

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

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

<b>Midterm 1:</b> 7.5 %	<b>Midterm 2:</b> 7.5 %	<b>Final Exam:</b> 50 %
<b>Quizzes, Lab. reports, Homework, Attendance &amp; Participation:</b> 35 %		

The grading distribution:

<b>A<sup>+</sup></b>	<b>A</b>	<b>B<sup>+</sup></b>	<b>B</b>	<b>C<sup>+</sup></b>	<b>C</b>	<b>D<sup>+</sup></b>	<b>D</b>	<b>F</b>
[95, 100]	[90, 95]	[85, 90]	[80, 85]	[75, 80]	[70, 75]	[65, 70]	[60, 65]	[0, 60]



### G. Student Workload

#	Teaching/Learning activities	Contact hours	Frequency	Total contact hours	Self-study hours	Total self-study hours	Student learning time
1	Lecture	0	0	0	0	0	0
2	Tutorial	0	0	0	0	0	0
3	Lab\practical	3	15	45	0	0	45
4	Lab report	0	10	0	2	20	20
5	Quiz	0	0	0	0	0	0
6	Lab exam	1.5	2	3	5	10	13
7	Final Exam	2	1	2	8	8	10
<b>Total</b>				<b>50</b>		<b>38</b>	<b>88</b>

The independent self-study is approximately 2.5 hours per week.

### H. 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](http://goo.gl/ykm7t3)

