

PHYS 123, Engineering Physics Lab II

Syllabus—Spring 2012

CATALOG DESCRIPTION	PHYS 123 Engineering Physics II Laboratory (0-3-1), spring. Concurrent enrollment in PHYS 122.
ACU MISSION STATEMENT	ACU's mission is to educate students for Christian service and leadership throughout the world.
DEPARTMENTAL VISION STATEMENT	The vision of the ACU Engineering & Physics Department is to be the premier engineering and physics department for the preparation of students for Christian service and leadership throughout the world.
INSTRUCTORS	Dr. Josh Willis, Assistant Professor Email: josh.willis@acu.edu (preferred means of contact) Phone: 674-2527 (office), 672-1646 (home, before 9 PM) Office: 317 Foster Science Building Office Hours: 2–5:30 PM WR
TEXT	The following text is required : <i>RealTime Physics Module 4: Light and Optics</i> by David R. Sokoloff, Ronald K. Thornton, and Priscilla W. Laws.
COURSE DESCRIPTION	Engineering Physics Lab II is in part an active-learning based experience to help you develop your understanding of optics (which will not be covered in lecture) and also to begin your more formal introduction to engineering and physics laboratory skills, including measurements and error and the written reporting of experiments. It meets for three hours each week, and in order to receive credit for the lecture component of the course, you must also receive credit for the lab.
COURSE GOALS	As will be seen from the competencies and measurement standards below, the primary goals of this course are to introduce you to basic optics, and to train you in the collection of data, estimation of its uncertainty, and its presentation. It will also mark your first exposure to the typesetting system L ^A T _E X, which is widely used in physics and other quantitative fields for preparing articles and reports.
ATTENDANCE & CONDUCT	The experiential nature of laboratory work means it cannot be adequately “made up” by alternate assignments. Therefore, you must attend each lab. You will only be excused from a lab if you have a valid university approved excuse; that is, where you miss lab because of illness, death in your immediate family, or travel on an ACU sponsored activity. The absence will not be excused until you have provided the instructor documentation in writing. Following university regulation, you will be dropped from the course with a failing grade if you miss more than 20% of the class meetings. <i>Note that for lab this occurs when you miss three or more labs, and applies even if some of those absences are excused.</i> If you know in advance that you will be away for an excused reason, you may attend a different meeting of lab during that week, but <i>only with the instructor's advance approval.</i> Aside from this circumstance, labs may not be made up. Labs begin promptly at the scheduled time. If you come in late <i>for any reason whatever</i> then you may not be admitted and will therefore receive a zero for that lab. You must turn in your completed lab at the end of the lab period.

COMPETENCIES
AND ASSESSMENT

Competency	Measurement Instrument	Measurement Standard
The student will be able to explain the behavior of light as it interacts with objects, mirrors, and lenses through geometric optics.	Labs and Homework	The student can identify where images will form or where objects must have been to form a given image when observed through lenses or mirrors.
The student understands and can apply basic features of the wave nature of light.	Labs and Homework	1. The student can predict the intensity of light through a sequence of polarizers, given the orientation of those polarizers. 2. The student can sketch what the intensity curve of a diffraction pattern will look like, for single or double slit, and mathematically relate that to the wavelength of light, and the width or spacing of the slits as appropriate.
The student can create a report using L ^A T _E X.	Lab Writeups	The basic elements of the report are present and properly formatted; each section contains the relevant information according to the rubric to be distributed in class.

GRADING SCALE Grades will be assigned based on the following scale for your overall average:

A	90-100%	D	60-69%
B	80-89%	F	< 60%
C	70-79%		

We will complete most of the six real-time physics labs in module 4. For those labs, 75% of your grade comes from the lab itself, and 25% from the homework that goes with it. The lab and homework for a given week are to be turned in at the *beginning* of the following week's lab. The labs themselves are each assigned a letter grade; there is no individual scoring of the activities in the lab. Rather, you will be assessed as follows:

- A** All parts of the lab completed, showing care in making hypotheses, summarizing conclusions, and reasoning accurately and concisely.
- B** At most one activity not fully completed (but still showing some work). Even if all activities are complete, some explanations may either be too terse to communicate all of your reasoning, or so verbose as to include much irrelevant information. Only minor errors in reasoning from the collected data to support the conclusions given.
- C** One activity completely absent or two or more not fully completed. Even if all activities are complete, there may be major gaps in reasoning, or only cursory attempts at tying conclusions to data.
- D** At best partial work with major errors in some places, but still at least one activity that shows fairly good work and understanding.

F Little meaningful work.

You will work in two or three person lab groups, but each person must turn in his or her own lab report, and receives an individual grade (though many labs will have portions where you are to state what your group either predicted or decided).

Some times parts of a lab will be skipped; you will be told this at the beginning of that lab.

After we have completed the sequence of Real-Time Physics labs, we will begin other labs that will require you to make more formal writeups, and in one case to design and conduct your own experiment. Further detail on the grading of those labs will be given in class as we come to them.

ACADEMIC INTEGRITY

As ACU students you are expected to embody honesty in all aspects of your life. Labs by design are collaborative activities, but you must each turn in an individual lab report representing your work. Moreover, falsifying data or other experimental results not only means you have not obtained a key learning activity, but also represents a serious violation of both academic and professional (i.e. scientific) integrity. Any first violation will result in a zero for that week's lab; a second violation will cause you to fail the course. You are also bound by the ACU academic integrity policy, found in the student guide. The required excerpt from that policy is as follows:

Violations of academic integrity and other forms of cheating, as defined in ACU's Academic Integrity Policy, involve the intention to deceive or mislead or misrepresent, and therefore are a form of lying and represent actions contrary to the behavioral norms that flow from the nature of God. Violations will be addressed as described in the Policy. While the university enforces the Policy, the most powerful motive for integrity and truthfulness comes from one's desire to imitate God's nature in our lives. Every member of the faculty, staff and student body is responsible for protecting the integrity of learning, scholarship and research. The full Policy is available for review at the Provost's office web site (<http://www.acu.edu/campusoffices/provost>) and the following offices: provost, college deans, dean of campus life, director of student judicial affairs, director of residential life education and academic departments.