Physics 3137 – Modern Physics Lab

**Room:** ROB 117,118 (labs) and Doherty Library 030 (computer labs)
**Times:** Wednesday 3:10pm - 6:00 pm

**Instructor:** Dr. Birgit Mellis  
**Phone:** 713-525-2129  
**email:** mellisb@stthom.edu  
**Office:** Robertson Hall, Room 112  
**Office Hours:**
- Mon: 12:00pm-1:00pm  
- Tue: 9:00am-12pm  
- Wed: 12pm-2:00pm  
- Fri: 1pm-2:00pm

**Instructor:** Dr. James Clarage  
**Phone:** 713-525-6979  
**email:** claragi@stthom.edu  
**Office:** Robertson Hall, Room 109  
**Office Hours:**
- MWF: 11am – 12:30pm  
- T/Th: 3-4pm  
- Other times: by appointment.

*(please put the course name in the Subject line of your emails, e.g., “Modern Phys Lec”, and note we do not read email on Sundays or late at night)*

**Course Description:**
Physics 3137 is the Laboratory to accompany the Modern Physics lecture course. The lecture course is a prerequisite or corequisite for the laboratory.

**Course Objectives:**
Each student is to become familiar with procedures and methods of advanced experimental as well as computational laboratories. This includes but is not limited to the setup and calibration of equipment, the collection and analysis of data, online simulations and writing code in ‘Mathematica’. Each student is to become proficient in reporting of experimental procedures and results, and be able to produce a typed formal report or an electronic notebook on experiments.

**Instructions/ Supplies:**
- **Lab Manual:**
  Instructions for the Labs are posted on blackboard under “Labs”. They have to be studied intensively and any prelab homework has to be completed **before** you come to class that day.
- **Be aware of and follow the safety instructions** for each lab!
- **Shoes:** You must wear **closed toe shoes** in lab.
- **You have to have access to “Mathematica”** for this lab. This program is installed in Robertson 115 as well as on all campus computers. Blackboard gives instructions on how to obtain the program for your personal computer. Students must have some way to store files during the semester (e.g. thumb-drive, dropbox, etc.).
- **Lab notebook:** You must purchase one bound notebook (i.e. composition book) to use in lab. It should contain bound pages, i.e., not loose-leaf or spiral.

**Blackboard:**
Blackboard ([http://gregory.stthom.edu](http://gregory.stthom.edu)) will be used to post instructions, grades, assignments, and announcements. Therefore you need access to the internet during the semester! Please check blackboard frequently to look for new postings.

All computer and blackboard problems or any technical questions should go to:  
University Help Desk, Robertson B112, 713-525-6900
Grading:

Your final semester grade will be based on the weekly laboratory work and participation. More specifically:

70% laboratory work (prelab work, lab reports, electronic notebooks etc…)
20% laboratory participation (attendance, attitude, cooperation, skill)
10% Standardized Exam

The letter grade for the course is based on the following Grading Scale:

A: (94-100) %, A-: (93-90)%
B+: (87-89)%, B (84-86), B- (80-83)%
C+ (77-79)%, C (74-76)%, C- (70-73)%
D+ (67-69)%, D (60-66)%
F (0-59)%

Lab Reports/Notebooks:

Some Labs require a formal write up of experiments in the form of a scientific paper; other Labs require a write up in form of electronic notebooks.
In case of a formal write up:
   • Everything, including tables, calculations and equations must be printed using a computer.
   • Diagrams and graphs must be legible and easily interpreted.
   • The specific format for each lab report is determined by the instructor

All lab reports/notebook will be graded on completeness, clarity and correct Physics!

Lab notebook (all labs):

Your lab notebook is the authentic record of your experiments. Please keep it neat and comprehensible so you can use it for your reports/notebooks. The first section for each lab should contain any notes from your readings before coming to lab.

Breakage Fee:

This is an advanced physics lab. The equipment in this lab is very expensive and is not covered by the “lab fee” of the University. Please work responsible and handle all equipment very carefully. When in doubt always ask the instructor first!

Attendance:

“The University expects all students to be regular and punctual in class attendance. Frequent unexplained absences may result in a student being administratively withdrawn from the course or in a grade reduction or failing grade, at the discretion of the faculty member” (see also Undergraduate Catalog).

Every experiment must be performed and the report submitted. A missed lab can only be “made up” under certain conditions agreed to with the instructor; which the student must initiate the week of the missed lab by contacting the instructor (in person, email or phone). Failure to complete a lab will result in a grade of zero for that experiment.
Accessibility and Accommodations:

Reasonable accommodations will be made for students with disabilities according to the University’s policy. If you need special accommodations please see the instructor and the Office of Counseling and Disability Services (C&DS) located on the second floor of Crooker Center.

Academic Honesty:

All students are subject to the university’s Policy on Academic Dishonesty and the UST Student Handbook. This extends to any quizzes taken online via Blackboard. Cheating will be punished in accordance with University procedures.

Checklist:

Before lab:
- Print out and read the lab instructions for each experiment and take lots of notes. Complete any prelab homework and hand it in at the beginning of class.

At lab:
- Bring lab instructions, lab notebook, scientific calculator
- Turn in prelab assignments due for this lab at the beginning of class
- Turn in results from previous week’s experiment at the beginning of class.

Experiments:

The instructors reserve the right to make reasonable changes to the syllabus during the course. In this event any necessary changes will be posted online and/or announced during class.

See next page for experiments and class schedule

Please remember….

Richard Feynman wrote that the most important quality in a physicist is his or her integrity. The true purpose of these labs is not just to get the right answer. Develop good lab habits…cleanliness, orderliness, creativity, but most of all, integrity in the results. It is far better to get strange data and try to explain why you think it is wrong then to “fudge.” Many advances in physics come from getting things wrong and figuring out why they went wrong!

We hope you all have a great semester and enjoy Modern Physics!

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Class Schedule:

See the lecture syllabus for calendar schedule of topics, labs, etc.