

Course Syllabus

PHY 4802L Laboratory Physics 1

Covid-19 Statement:

In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

- You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements is all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing. Please do not move desks or stations.
- Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
- Follow your instructor's guidance on how to enter and exit the classroom. Practice physical distancing to the extent possible when entering and exiting the classroom.
- If you are experiencing COVID-19 symptoms ([Click here for guidance from the CDC on symptoms of coronavirus](#)), please use the UF Health screening system and follow the instructions on whether you are able to attend class. [Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms](#).
 - Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. [Find more information in the university attendance policies](#).

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Course Description

The purpose of this course is to provide you with a working knowledge of electronic circuitry and laboratory instrumentation. This course will be different from others you have taken in your major. This may be the first time you apply the theories you've learned to physical situations that you control. You'll need to rely heavily on problem-solving techniques and common-sense, in addition to problem-solving based on physics.

The course is **very time intensive**. You should expect to spend several hours a week outside of class on the reading assignments, lab work, and lab reports. You might want to check out the [hints on being a successful student](#).

The [course schedule linked here](#) is preliminary and subject to change.

Instructors

Prof. Andrew Rinzler: Office 2251 NPB; Phone: (352) 392-5656,
Office Hr. Tu & Th 8th period (3-4pm) or by appointment.

Assist. Prof. Xiao-Xiao Zhang: Office 2259 NPB; Phone (352) 392-5711,
Office Hr. Tu & Th 3rd period (9:35-10:40am), or by appointment.

Required Texts

You are expected to read the material to be covered in each lab *prior* to coming to class. Time constraints limit the material that may be covered in each week's lecture. The lectures can not be and are not a substitute for the reading assignments. The lab report questions and in-class quizzes will be based on materials covered in lectures as well as those listed in the reading schedule. Material not covered in the lecture may be included on the quizzes and in the labs.

- Textbook: Basic Electronics for Scientists and Engineers, D. L. Eggleston
- Supplementary Textbook: Practical Electronics for Inventors, P. Sherz & S. Monk
- Lab Manual: PDFs uploaded by the instructors during the semester.
- Lecture Notes: PDFs uploaded by the instructors during the semester.

Required Materials

You are encouraged to print the Lab Manual chapters and Lecture Notes to have handy when needed. You should additionally bring:

- **Your laptop computer to run the instrumentation**
- a Lab Notebook (to be provided for F2F class)

You should also read: [How to keep a notebook](#) prior to starting the labs. There is an instructional video online. You can watch this at home or if you decide to watch it during class, please bring headphones to avoid disturbing others.

The textbooks, lectures, and lecture notes and Lab Manual will provide the necessary background information for understanding the Labs to be performed. You are strongly encouraged to read through the relevant Lab Manual section and book reading assignment *before* the dates established for working on the labs in the schedule below.

Lab Safety

Emergency contacts:

- Dr. DeSerio: NPB 1236, Phone: (352) 392-1690
- Prof. Rinzler: NPB 2251, Phone: (352) 392-5656
- UF campus police: Phone: (352) 392-1111

Grading

- Lab Prep (includes Homework) 30%
- Lab Reports: 30%
- Final Project: 25%
- Instructor evaluation of your effort and engagement 15%

Please check with your instructor if you have questions about the grading scale.

Homework/Quizzes

The homework will consist of textbook exercises as occasionally assigned by the instructor. Another component of the "homework" (implemented as quizzes in Canvas) will consist of LTspice simulations of selected circuits that are due the night before the circuit is to be built in the lab. Due dates and assignments for these quizzes can be located from the "Quizzes" link or in the "Course Summary" below. There may also be in-class quizzes on material that you should have internalized by the day of the quiz from the reading assignments and previous lectures. The textbook and the student manual have many practical examples which be might modified for quiz questions.

Lab Work and Lab Notebook and Lab Reports

Among the important aspects of this course are learning how to work with electronic components and instrumentation to get from them what you want, how to take notes and maintain a notebook, and how to write good reports. We will circulate in the lab rooms to provide help and evaluate your performance. We may also check your notebooks to provide advice on note keeping. See [How to keep a lab notebook](#) for further instructions.

The content expected in the four Lab Reports due throughout the semester can be found here ([link](#)), an example report here ([link](#)) and notes regarding this report here ([link](#)).

Assignment due dates will be strictly followed. Late assignments will incur a **severe penalty** of up to 15% off per day late. After 4 days late the maximum grade for the assignment (assuming perfect work) will be 50%.

Instrumentation

You will be loaned individual instrumentation and component kits (more on this below) and are expected to build and measure each circuit discussed in the Lab Manual yourselves. However, two minds are greater than one, so you will be partnered in groups of two, to collaborate (while maintaining safe social distancing) on your circuit builds and measurements. That said, the prelab, assignments, the homework and the lab reports are to be individual efforts. Discussion with and help from your peers is encouraged, but **copying of work is not. Both members in each team should participate in taking data and in the analyses.** Exclusively dividing the lab work is strongly discouraged. Lab partners will typically be rotated with each new chapter of the Lab Manual.

Final Project

Rather than a final exam this course has a final ("Skunkworks") project to be worked on in teams of two in the weeks leading up to the end of the semester (see schedule). Partners are self selected by mutual agreement as the time approaches, so make note of with whom you worked well in doing the labs. Each project will be to build a circuit, having a complexity going well beyond those in the lab manual, meant to perform some stated function. The circuit/function can be devised by the team from scratch, or it can be a circuit identified from the literature or some combination of these. In either case, it must be approved by the instructor before detailed work begins (see schedule). The completed circuit will be demonstrated for the class as part of a final PowerPoint-like presentation during finals week. This should detail how the elements of the circuit come together to perform its function. Considered in the grading will be circuit's complexity (with designed circuits ranking higher than found circuits), the quality of the circuit's descriptions in the presentations (appropriately using principles learned throughout the course) and finally execution (did the circuit work, doing what was intended). You are responsible for ordering and purchasing any parts needed for your project that are not already available. Electronic components are fortunately not expensive but overnight shipping can greatly add to the cost. If you plan well in advance you should not need to resort to overnight shipping. If you want to keep your project you will need to order breadboards and any needed components to take with you.

Equipment loaned

Once all presentations are complete, you must return the loaned instrumentation and tools in the condition in which you received them. No grade will be given, potentially delaying your graduation and future plans, until you have done so. It is understood that electronic equipment can spontaneously fail and you will not be held responsible for such circumstance. If, however, it is determined that the failure was due to misuse or neglect (e.g.

you spilled your morning coffee on the powered Mk2, or you fried one of its power supplies by connection to the external supply without a fuse), you will be charged up to \$200 replacement costs. Please be kind to future students taking this course and pass them the equipment in a condition as close as possible to how you received it.

The **Course Summary** below lists the **due-by** times/dates of the various assignments for the class (subject to modification and additions as needed). **Not shown** are the meeting times for the lecture/lab meetings. For the F2F class these recur on Tuesdays and Thursdays 11:45am - 2:45pm (P5-7) beginning on Tue. Jan. 12, 2021 through Tue. Apr. 20, 2021 (excluding Thu. Feb. 25th).