



LOYOLA  
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CHICAGO

*Preparing people to lead extraordinary lives*

Department of Physics  
PHYS 126F, Freshman Projects  
Section 02E, Spring 2020

**Class Meeting Times:** The scheduled meeting time is Thursdays from 4:30-6:30 in St. Joseph's Dining Hall; other meeting times may be agreed upon by the group. We will meet other times as needed. The required final presentation will be scheduled by the department. All students should plan to attend the final presentations.

**Statement of Intent:** All students should read this syllabus all the way through and make sure they understand the course policies prior to the first day of class. By remaining in this course, students are agreeing to accept this syllabus and to abide by the guidelines outlined in the document. Students will be informed should there be a necessary change to the syllabus.

**Instructor Information:**

Professor: Jon Bougie

Campus Office: St. Joseph's Hall, room 124

Email: [jbougie@luc.edu](mailto:jbougie@luc.edu)

Phone: 773-508-3543

Office Hours: Will be announced during the first week of classes and posted on Sakai. Please see the addendum regarding tentative office hours until I finalize my schedule.

**Course Description:** Under the guidance of a faculty member students carry out research in the area of mechanics, waves or thermodynamics. The project must involve submission of a proposal, building of a setup, carrying out related theoretical calculation followed by experimentation.

**Course Outcomes:** Students should get a deeper understanding of the material covered in PHYS 125 (mechanics, waves and thermodynamics) and also learn about research methods employed by physicists.

**Required Course Materials:** Students should have a scientific calculator. The group will need to supply a lab notebook.

**Course Prerequisites:** PHYS 125. Department Consent required. Students lacking the proper prerequisites for this class may be removed from the class at any time during the semester.

**Course Goals and Learning Outcomes:** In line with the above course description and outcomes, I have identified the following specific learning outcomes:

- 1) Students will deepen their understanding of physical principles and research methods by engaging in an investigation of a particular problem.
- 2) Students will work as a part of a team towards a common goal and will make individual contributions that advance the common efforts of the group.

3) Students will apply ideas to new situations and to extend the material covered in the introductory physics sequence. Students will play an active role in the development of their understanding and to the classroom environment.

4) Students will present scientific and technical ideas and assess the efforts of their group by presenting their results to their peers.

**Course Requirements and Grading Policy:** Every project must contain the following three elements:

a) Theoretical analysis: The project should test theoretical predictions or apply theoretical concepts to understanding experimental results. This includes the mathematics required to model and analyze the physics concepts of the project.

b) Apparatus: The group must design an experiment and build an appropriate apparatus. This phase can consist of building or modifying apparatus for the experimental portion of the project.

c) Experiment: Once built, the experiment must be carried out. The experimental part of the project includes taking data, analyzing it and relating it to the theoretical calculations.

These elements will be tested through the five major requirements for this course, each of which will be elaborated in the following pages:

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|----|--|-----|
| 1) | Individual contribution to the group   | 40% |
| 2) | Project design, execution, and documentation (including proposal and notebook) | 40% |
| 3) | Presentation and final reflection  | 20% |

**Contributions to the group effort:** All of the elements of the project that will be turned in or presented (proposal, notebook, presentation, and poster) are group assignments, not individual assignments. However, a group can only be effective if all members of the group are actively participating in the group work. A grade will be assigned to each group member individually, reflecting their participation and contributions to the group effort on a weekly basis. Participation will be evaluated by the faculty mentor based on each student's attendance at weekly meetings, leadership, participation in group work, contributions to the project, willingness to work as a part of the team, and peer review assessment. As a part of the peer review assessment, students may be asked to assess their team members' contributions to the team goals. Each student is allowed to drop their lowest week's participation score (whether due to absence or other reasons). Additional absences will require the student to make additional contributions outside of the scheduled time and may impact their participation grade. Organization of work and cleanup at the end of the semester will be evaluated as part of the participation grade.

**Project Design and Execution:** The group as a whole will be evaluated on the way in which they carry out the three elements listed above throughout the course of the semester:

a) Theoretical analysis: The project should test theoretical predictions or apply theoretical concepts to understanding experimental results. This includes the mathematics required to model and analyze the physics concepts of the project.

b) Apparatus: The group must design an experiment and build an appropriate apparatus. This phase can consist of building or modifying apparatus for the experimental portion of the project.

c) Experiment: Once built, the experiment must be carried out. The experimental part of the project includes taking data, analyzing it and relating it to the theoretical calculations.

**Project Documentation (Proposal):** Working with the faculty advisor, the group will draft a proposal for the project that includes objectives, general tasks to be performed in support of the objectives, equipment needed to perform the necessary tasks and an approximate timeline. This proposal is due at

the end of the second week of the semester. Note that some details contained in the proposal may be changed as the project develops. However, the proposal should explain a clear plan for carrying out the project over the course of the semester.

**Project Documentation (Notebook):** The group should have a notebook with them at all times when they are working on the project. All work done in the project must be recorded in the notebook. A handout with notebook guidelines will accompany the syllabus. The notebook assignment may include a video log of the student activities as they progress in the semester. Details of this assignment will be announced in class.

**Presentation and Final Reflection:** Each group will present the results of their project to the other Freshman Project groups near the end of the semester. The presentation will be evaluated based on the organization and style of the presentation; introduction and motivation for the project; presentation of calculations, data, and results; conclusions and completeness; and appropriate citations. Details of Final Reflection and Presentation assignments will be given by the instructor.

**Grading scale:** The grading scale below shows the percentage range for each letter grade. If needed, I reserve the right to lower the cutoff so you receive a better grade than indicated by the scale.

A	[93, 100]
A-	[90, 93)
B+	[87, 90)
B	[83, 87)
B-	[80, 83)
C+	[77, 80)
C	[73, 77)
C-	[70, 73)
D+	[65, 70)
D	[60,65)

**Communication Protocol:** Email is the best way to reach me, using my Loyola email address: jbougie@luc.edu. This course will also use the Sakai system of Loyola University to distribute information outside of class time. You should check Sakai regularly.

**Intellectual Property:** All lectures, notes, PowerPoints, videos, and other instructional materials in this course are the intellectual property of the instructor. As a result, they may not be distributed or shared in any manner, either on paper or virtually without my written permission. Students may not record class activities without my written consent; when consent is given, those recordings may be used for review only and may not be distributed.

**Class Conduct:** My goal is to create an atmosphere in which all students are able to engage with the class, the subject matter, and their classmates. Questions and ideas from students are always welcome. Please be respectful of your fellow students; insulting comments or actions (for example, racist, sexist, homophobic, or transphobic remarks) will not be tolerated.

**Academic Integrity:** Loyola University Chicago takes seriously the issues of plagiarism and academic integrity. Loyola has an academic code of conduct that students are expected to follow. Any incidence of academic dishonesty will result in a grade of "0" and will be reported to both the Chairperson of the Physics Department and the Dean of the College of Arts and Sciences. A full copy of the Statement of Academic Integrity is available online in the undergraduate catalog. ([www.luc.edu/academics/catalog/undergrad/reg\\_academicintegrity.shtml](http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml))

**Special Circumstances--Receiving Assistance:** Students are urged to contact me should they have questions concerning course materials and procedures. If you have any special circumstance that may have some impact on your course work, please let me know so we can establish a plan for assignment completion. If you require assignment or testing accommodations, please contact me early in the semester so that arrangements can be made with the Student Accessibility Center (<https://luc.edu/sac/>). I will make every reasonable effort to accommodate the needs of students in the class; however, it is the responsibility of the student to arrange for such accommodations sufficiently in advance to allow for appropriate implementation.

**Student Support Resources:**

- ITS Service Desk
  - [helpdesk@luc.edu](mailto:helpdesk@luc.edu)
  - 773-508-4487
  - <https://luc.edu/its/>
- Library
  - Subject Specialists: <http://libraries.luc.edu/specialists>
- Student Accessibility Center
  - <https://luc.edu/sac/>
- Writing Center
  - <http://www.luc.edu/writing/>
- Ethics Hotline
  - <http://luc.edu/sglc/aboutus/>
  - 855.603.6988

The University schedule for this semester can be found at <http://www.luc.edu/academics/schedules/>.