

PHYSICS 168 – Introductory Physics 1 – Calculus Treatment

FALL 2019

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Texts: *No textbook required.*

Course website: <http://www.lehman.edu/faculty/anchordoqui/168.html>

Lectures: Tuesdays and Thursdays 2:00 – 3:40 PM, Gillet 331. Lectures begin August 27, 2019.

Office Hours: Tuesdays and Thursdays 3:45 PM - 4:15 PM

Laboratory: Attendance at the weekly laboratory is mandatory. Department policy is that students who miss more than two labs will fail the course. Labs can only be made up for documented medical emergencies, and only during the week they are originally scheduled. If you miss a lab let me and your lab instructor know as soon as possible.

Worksheets: Homework sets are available on the course website. Each homework set consists of questions used as worked examples in lecture, questions covered during discussion, and questions assigned as homework exercises.

Tests: Three tests will be given during the semester (see schedule on page 3).

Final: There will be a comprehensive final exam; Thursday December 19 at 1:30 -3:30 PM.
The final is mandatory and you are responsible for making sure that you can attend at this time.

Grading: The overall course grade will be determined as follows:

- 10 % - from quizzes
- 45% - midterm exams (15% each)
- 25% - comprehensive final exam
- 20% - laboratory

Grading policy:

Letter grades will be assigned according to the guidelines

- A = 90 - 100
- B = 80 - 90
- C = 65 - 80
- D = 50 - 65
- F = below 50

The cutoffs for +'s and -'s will be decided at the end of the semester.

Tutoring:

Tutoring is available in the Science Learning Center, Gillet 133. Textbooks and study questions are available. Hours for this course will be posted on the door.

How to be successful in Physics 168 — PLEASE READ CAREFULLY

1. This is not a correspondence course; attendance at lectures and discussions is highly encouraged. Indeed attendance will be taken at each class. A sign-up sheet will be passed around.
2. Make sure you visit the course website regularly. Check the announcements. You will have to download a set of problems every week. Two or three problems from each homework set will be selected at random for quizzes.
3. The importance of basic math cannot be over-emphasized. You absolutely *must* be comfortable with basic algebra, trig, arithmetic, and differential calculus. You are expected to handle problems that use only algebraic variables.
4. QUIZZES: a short (about 10-15 minutes) quiz based on the material covered in recent lectures will be given at the end of every lecture.
5. TESTS: test problems are loosely based on those you will find in the homework sets. Please note that this does not mean these problems will simply be repeated on tests. Please check the schedule of tests for conflicts with religious observance. Please let me know ASAP if you see any conflicts; a different time will be arranged so that you can take the test. Make-up tests will be given only for valid reasons.
6. Make sure you bring a scientific calculator to lecture and discussion. You will need a calculator during tests and quizzes.
7. Please contact me immediately if you think that a genuine mistake has occurred in the grading of tests. Clerical errors in grading will of course be rectified as soon as possible.
8. Students with special requirements/learning disabilities should see me as early as possible during the semester. **Note** that it is the responsibility of students with special accommodations to contact the instructor as early as possible to make the appropriate arrangements for testing. Please note that I cannot allow students to take tests under conditions different from those experienced by the rest of the class (extra time, separate room, etc.) *unless they have the appropriate paperwork (VISA form) from the Student Accessibility Center*. The Student Accessibility Center will issue formal instructions to me about how students with disabilities are to be accommodated.

General Education Requirement (GER):

This course carries GER credit in the area of Natural Sciences. You will explore the foundations underlying our knowledge of the physical world, with the goal of gaining an understanding of the physical laws governing matter, energy, and physical (as well as chemical and biological) phenomena. Physics is not about memorizing facts or formulas, but about developing the conceptual framework to connect experiments to the models, theories, and physical laws used to describe the natural world, including how experimental science can be used to distinguish among competing theories. Throughout the course – in classes, discussions, and through homework – you will be required to critically assess the presented concepts and be able to apply your knowledge to the solution of physical problems.

The course formally covers linear kinematics and dynamics, rotational kinematics and dynamics, conservation laws, oscillatory and wave motion, and thermal physics; students must learn to use general physical principles to set up and solve mathematical models. A sound knowledge of algebra, basic differential calculus, and excellent problem-solving skills are required. Students are required to assimilate general physical principles and then to apply these to particular cases, which are drawn from many different fields, including basic mechanical engineering, biomechanics, practical acoustics, and thermal physics. Interdisciplinary applications and the broader context are emphasized through discussion of applications to health sciences (ultra sound scans and the Doppler effect), design and biomechanical engineering, global warming, and other issues of contemporary interest.

Provisional Course Outline

(Please note this may be revised during the course to match coverage of material during lectures, etc.)

- 1st week:** *Motion in one dimension*
- 2nd week:** *Motion in two and three dimensions*
- 3rd week:** *Newtonian dynamics*
- 4th week:** *Circular motion*
- 5th week:** *Conservation theorems: energy*
- 6th week:** *Conservation theorems: momentum*
- 7th week:** *Rotational dynamics*
- 8th week:** *Conservation theorems: angular momentum*
- 9th week:** *Gravitation*
- 10th week:** *Static equilibrium*
- 11th week:** *Fluids*
- 12th week:** *Oscillations and waves*
- 13th week:** *Temperature, kinetic theory of gases, and thermodynamics*

Midterm Exams: *October 10, November 26, December 12, 2019*

Fall 2019 Calendar

- August 27: Lecture 1
- August 29: Homework 1
- September 3: Lecture 2
- September 5: Classes follow a Monday schedule
- September 10: Lecture 3
- September 12: Homework 2
- September 17: Lecture 4
- September 19: Homework 3
- September 24: Lecture 5
- September 26: Homework 4
- October 1: No classes scheduled
- October 3: Homework 5
- October 8: No classes scheduled
- **October 10: Midterm Exam**
- October 15: Lecture 6
- October 17: Homework 6
- October 22: Lecture 7
- October 24: Homework 7
- October 29: Lecture 8
- October 31: Homework 8
- November 5: Lecture 9
- November 7: Homework 9
- November 12: Lecture 10
- November 14: Homework 10
- November 19: Lecture 11
- November 21: Homework 11
- **November 26: Midterm Exam**
- November 28: Thanksgiving Holiday
- December 3: Lecture 12
- December 5: Homework 12
- December 10: Homework 13
- **December 12: Midterm Exam**
- **December 19: Final Exam**