

University Physics I Phys 251 syllabus
Spring 2017
(4 credits)
Coreq: MATH 165

Instructor

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Course Description

Physics 251 is a detailed introduction to Newtonian mechanics of translational and rotational motion, work, energy, power, momentum, conservation of energy and momentum, periodic motion, waves, sound, heat, and thermodynamics. There are four lectures each week with weekly HW assignments and other outside the class required work.

Course goals

Students completing Physics 251 should be able to solve Newtonian mechanics problems that require *both* conceptual and mathematical understanding of the material. Students must develop qualitative and quantitative reasoning skills necessary to answer novel questions that were not explicitly discussed in class. Students must be able to provide alternative solutions, check answers for consistency, and identify mistakes in their incorrect lines of reasoning (if appropriate).

Prerequisites

Math 165 (prereq/coreq)

Class Hours

Monday, 11:00am-12:50pm, Hill 130/132
Wednesday and Friday, 11:00am-11:50am

Office Hours

Tuesday, 12:00pm - 12:50Pm
Wednesday after class, 12:00pm - 12:50pm
Friday, 3:00pm - 3:50pm

Office hours will be held during the times specified above. However, you are welcome to contact me via email in order to arrange a different time to meet.

In addition, you may visit:

- [LAs office hours \(TBD\)](#):
- [a tutor room](#) on the third floor of South Engineering building staffed with experienced physics TAs that provide extra help: https://www.ndsu.edu/physics/current_students/ta_office_hours/
- [ACE Tutoring Center](#), which assists students with coursework, study skills, and test preparation: http://www.ndsu.edu/studentsuccess/tutoring_schedule/

Course materials

1. Textbook (optional): Halliday, D.; Resnick, R.; Walker, J. *Fundamentals of Physics*, 9th ed. Wiley, 2011. (full version)
2. Turning Technologies transmitter unit (clicker) or ResponseWare for Mobile Devices.
3. Scientific calculator.
4. Four opscan sheets and a #2 pencil.

Course format

Phys 251 meets three times a week in a large SCALE-UP room equipped with discussion tables, white board, and display monitors. As such, a significant amount of time will be devoted to group work and class discussions. Lecture component will be reduced significantly compared to a typical lecture format. Learning assistant will be available to help you tackle physics topics.

Memorization of material is not helpful in Physics. Your goal must be to refine your intuition (intuition that you already have!) about many physics-related situations and to make sense of how “things” work. To achieve this goal, you must be actively involved in the process of learning. Science (Physics specifically) cannot be learned by listening to an instructor explaining concepts and solving problems on a board. During the class discussion period, you are strongly encouraged to talk to other students, explain your reasoning and understanding of a specific physics situation, argue to defend your answer, and ask questions. You should feel free to ask questions any time during class.

Attendance

Attendance is not required, however, participation in discussion of in-class “clicker” questions will contribute up to 5% to the final grade.

How to succeed in this class

Please check out a set of five short videos on how people learn and on effective strategies for learning.

<http://www.youtube.com/playlist?list=PL85708E6EA236E3DB>

The videos are created by Stephen L. Chew, a cognitive psychologist at Samford University. The videos discuss common student misconceptions about learning (memorization of facts, reading lecture notes as opposed to processing information, etc.). The videos also include discussions of effective strategies for academic success. There is a sequence of 5 episodes, you can watch all of them in under 30 minutes. I am extremely impressed by the videos. I think you will enjoy the videos as well. Check them out!

Homework assignments

Two types of HW assignments will be given: weekly web-based [LON-CAPA](#) HW and written HW. All homework assignments are due on the dates specified. **Late homework will not be accepted.**

Link to LON-CAPA: <https://proteus.physics.ndsu.nodak.edu/adm/roles>

Exam Information

During the semester, three one-hour midterms will be given. At the end of the semester there will be a comprehensive final exam. The lowest midterm grade will be dropped.

Exam 1: Friday, February 3

Exam 2: Friday, March 3

Exam 3: Friday, April 7

Final exam: Friday, May 12, 8:00am-10am.

You now have the complete schedule of exam dates and times. Do not schedule any other activity during these times as **there will be no makeup exams.**

All exams will have multiple-choice questions (you will get credit for correct answers only) and free-response questions (you will be asked to explain your reasoning and show your work; you will be given credit for partially correct answers as well). Free-response questions will make up ~25% of questions on each exam (e.g., 5 free-response questions, 14 multiple-choice questions). To allow for partial credit on free-response questions, each exam question will be worth 5-7 points. However, since only *percentages* contribute to the calculation of your final grade in the course, only the percentage of points earned on each test is relevant, *not* the absolute number of points.

Please note

Only standard scientific calculators will be allowed on the tests. No other electronic devices will be allowed on the tests. If you need a dictionary, please bring a paper version; no electronic dictionaries will be allowed.

Grading information

Your final grade in physics 252 will be determined on the following basis:

Homework: 30%

Exams: 60%

- Midterm Exams (two): 20% each
- Final Exam: 20%

Ungraded work, points are assigned based on student participation efforts regardless whether responses are correct or incorrect: 10%

- In-class participation efforts (clicker points, class discussions): 5%
- Pretest participation efforts: 5%

Extra credit HW problems: 3%

Letter Grading:

89.5 to 100% = A

79.5 to 89.4% = B

69.5 to 79.4% = C

59.5 to 69.4% = D

Special Considerations

Any students with disabilities or other special needs, who need special accommodations in this course, are invited to share these concerns or requests with the instructor and contact the [Disability Services Office \(www.ndsu.edu/disabilityservices\)](http://www.ndsu.edu/disabilityservices) as soon as possible.

Veterans and student service members with special circumstances or who are activated are encouraged to notify the instructor as soon as possible and are encouraged to provide Activation Orders.

Academic Responsibility

The academic community is operated on the basis of honesty, integrity, and fair play. [NDSU Policy 335: Code of Academic Responsibility and Conduct](#) applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the [Office of Registration and Records](#). Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.