

Wentworth Institute of Technology
Physics 1250 (Engineering Physics I) Fall 2015 – Section 11399/11400

Instructor: Dr. Marissa Vogt
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Schedule: Lectures Tuesdays & Thursdays 5-6:15 p.m., Dobbs Hall 306; lab
Monday, 5-6:50 p.m., Ira Allen 201
Office hours: Tuesday 4-5 p.m., Thursday 6:15-7:15 p.m., and by appointment
Textbook: Young and Freedman, “University Physics”, 14th edition
Course website: all instructor-created course materials and updates will be posted at
<http://sites.bu.edu/marissavogt/home/teaching/wentworth-physics-1250-fall-2015/>

Course Syllabus

Course Learning Objectives

At the completion of this course, the student should be able to:

- Apply dimensional analysis and convert units of physical quantities.
- Use vectors to describe physical observations.
- Perform and demonstrate detailed problem solving expertise.
- Use calculus to derive formulas for kinematics.
- Apply Newton’s Laws of motion, and be able to resolve vector diagrams on static and dynamical systems.
- Describe the physics of rotational motion.
- Define the scientific meaning of energy, work, and power.
- Describe Newton’s laws via momentum.
- Describe momentum via calculus.
- Define Mass, and contemplate its origin.
- Apply Newton’s laws to gravity, and use this information to describe orbital motion

Exams

The course will have 3 midterm exams and a cumulative final exam. The final exam will be scheduled by the registrar and the schedule will be posted on LConnect. All exams will be closed book.

Weekly Quizzes

There will be short, semi-weekly, closed book quizzes to test your understanding of the topics from the most recent lab(s) and lecture(s). The quizzes will be given during the first 5-10 minutes of the class period, so please be on time.

Course Schedule

Ordering of topics is subject to change, but quiz and midterm exam dates are firm.

Date	Class	Topic
R 9/3	Lecture 1	Introduction & syllabus, unit conversions, math review
M 9/7	<i>NO LAB</i>	<i>Labor day holiday</i>
T 9/8	Lecture 2	Vectors (addition, components, unit vectors)
R 9/10	Lecture 3	Quiz 1 ; 1-D kinematics, velocity, acceleration
M 9/14	Lab 1	<u>Reaction time, physical measurements, and uncertainty lab</u>
T 9/15	Lecture 4	Acceleration, gravity, free fall
R 9/17	Lecture 5	Quiz 2 ; 3-D kinematics, projectile motion
M 9/21	Lab 2	<u>Projectile motion lab</u>
T 9/22	Lecture 6	Circular motion, coordinate transformations
R 9/24	Lecture 7	Quiz 3 ; relative velocity, reference frames
M 9/28	Lab 3	<u>TBD (will include midterm review)</u>
T 9/29		MIDTERM 1 (Lectures 1-7, Labs 1-3)
R 10/1	Lecture 8	forces, Newton's first and second laws
M 10/5	Lab 4	<u>Static equilibrium lab</u>
T 10/6	Lecture 9	Newton's third law, force diagrams
R 10/8	Lecture 10	Quiz 4 ; Equilibrium, free-body diagrams
M 10/12	<i>NO LAB</i>	<i>Columbus day holiday</i>
T 10/13	Lecture 11	Friction and resistance
R 10/15	Lecture 12	Quiz 5 ; Forces in circular motion
M 10/19	Lab 5	<u>Atwood machine lab</u>
T 10/20	Lecture 13	Work done by a force, kinetic and potential energy
R 10/22	Lecture 14	Quiz 6 ; Conservation of energy, power, conservative forces
M 10/26	Lab 6	<u>Spring lab (will include midterm review)</u>
T 10/27		MIDTERM 2 (Lectures 8-14, Labs 4-6)
R 10/29	Lecture 15	(No quiz) <i>Special guest lecture</i>
M 11/2	Lab 7	<u>Atwood machine conservation of energy lab</u>
T 11/3	Lecture 16	Momentum, impulse, collisions
R 11/5	Lecture 17	Quiz 7 ; Center of mass, rotational motion, moment of inertia
M 11/9	Lab 8	<u>TBD</u>
T 11/10	Lecture 18	Torque, rotational dynamics, angular momentum
R 11/12	Lecture 19	Quiz 8 ; Angular momentum
M 11/16	Lab 9	<u>TBD</u>
T 11/17	Lecture 20	Work and energy in rotational motion, rolling motion
R 11/19	Lecture 21	Quiz 9 ; Orbital motion, Kepler's laws
M 11/23	Lab 10	<u>TBD (will include midterm review)</u>
T 11/24		MIDTERM 3 (Lectures 15-21, Labs 7-10)
R 11/26	<i>NO CLASS</i>	<i>Thanksgiving holiday</i>
M 11/30	Lab 11	<u>TBD</u>
T 12/1	Lecture 22	Review session for final exam (date/time of final TBD)

There will be a final exam during finals week, date/time to be set by Wentworth registrar's office.

Textbook

This course will use Young & Freedman “University Physics” 14th edition. Reading assignments and homework will be assigned from this edition of the textbook, so it is recommended that you purchase the 14th edition. If you choose to purchase a used, older version of the textbook, please ensure that the new version will be accessible to you (for example by borrowing briefly from a friend or going to the library) for these assignments.

Homework

Homework will be assigned approximately every week. The goal of the homework exercises is to give you a change to practice the topics you learn in class. Collaboration with other students is encouraged but please ensure that the work you turn in is your own. If you have studied or worked through problems with other students, please write their names at the end of your completed assignment.

Mastering Physics

Some optional (ungraded) homework exercises and pre-lecture videos will be available online through the Mastering Physics website (masteringphysics.com). You will need to purchase an access code, which can be purchased along or can come bundled with the physical textbook or e-text. You will also need the course ID MPVOGT2015. Mastering Physics access will not be required for the course but is recommended.

Lab Sections

The course includes weekly lab sections. Some of this time will be devoted to hands-on lab projects where you will be able to see physics in action! Some lab sessions will be used for problem solving exercises and course review. Food and drink are strictly not allowed in the lab and must be left outside.

Attendance, excused absences, and late homework

- Students should consult Wentworth’s attendance policies, which are posted at <http://www.wit.edu/catalog/currentcatalog/academic-policies/Attendance.html>
- Attendance during lectures and lab is expected.
- Student absences from weekly quizzes, midterm exams, or the final exam must be excused and should be accompanied by an appropriate note (such as from a doctor or coach). Make-up exams will be held at the instructor’s discretion. Except in case of an emergency, the instructor must be notified ahead of time or the absence will be unexcused.
- Late homework will not be accepted except in cases of unforeseen illness or other unforeseen circumstances (and should be accompanied by an appropriate note).

Academic honesty and personal conduct

Students are expected to adhere to Wentworth’s policies on academic honesty and personal conduct (<http://www.wit.edu/catalog/currentcatalog/academic-policies/Academic-Honesty.html>). Each student is expected to be respectful towards themselves, their fellow students, and the instructor or any guest lecturers.

Grading

Course grades will be determined based on the following breakdown:

Weekly quizzes	5%
Homework	15%
Labs	10%
Midterm 1	15%
Midterm 2	15%
Midterm 3	15%
Final Exam	25%

Grades will be assigned following Wentworth's academic policies (please see <http://www.wit.edu/catalog/currentcatalog/academic-policies/Grading.html>):

Grades	Expected Achievement
A-, A	Student learning and accomplishment <u>far exceeds published objectives</u> for the course/ test/ assignment and student work is distinguished consistently by its high level of competency and/or innovation.
B, B+	Student learning and accomplishment <u>goes beyond what is expected in the published objectives</u> for the course/ test/ assignment and student work is frequently characterized by its special depth of understanding, development, and/or innovative experimentation.
C, C+, B-	Student learning and accomplishment <u>meets all published objectives</u> for the course/test/assignment and student work demonstrates the expected level of understanding and application of concepts introduced.
D, D+, C-	Student learning and accomplishment based on the published objectives for the course/test/assignment <u>were met with minimum passing achievement</u> .
F	Student learning and accomplishment based on the published objectives for the course/test/assignment <u>were not sufficiently addressed or met</u> .