Engineering Physics 1 (Physics 1135): Syllabus and Schedule Fall 2025
(Last updated 11/20/2025 – subject to change)

Head instructor and course coordinator: Dr. Agnes Vojta, 206 Physics, vojtaa@mst.edu

Required materials: Textbook *University Physics* (11th, 12th ,13th or 14th edition) by H.D. Young & R.A. Freedman; Laboratory Manual. Computer with internet access. Scanner or scanning app.

Canvas: All information, handouts, lecture notes and video lectures will be available through Canvas. If corrections to this syllabus are required, the official version will be the one posted on Canvas. There will be separate Canvas pages for lecture and recitation.

Office hours: Instructors will hold their office hours by being available in the Physics Learning Center. See the instructor information on the lecture Canvas page in the Course Info Module.

Course goals: Develop an understanding of the basic principles of mechanics (statics and dynamics) and acquire the proper techniques for the solution of physical problems.

Prerequisite: Calculus 1 (Math 1214 or 1211)

Major Components of the Course

Lecture (Tuesday & Thursday – required): I will review important concepts of the reading assignment and solve example problems to illustrate physical principles and problem–solving techniques. To get the most out of lecture, you should read the reading assignment before class. The online lectures are available for the entire semester.

Recitation (Wednesday & Friday – required): You will practice problem solving and discuss conceptual questions. The instructors for the recitation sections will be announced on the first day of class. Your recitation instructor is your first contact for all questions and concerns regarding the course, and they are keeping your grades.

Laboratory (every other week – required): You will perform experiments to reinforce concepts learned in lecture and recitation and connect those to physical experience. Lab exercises will illustrate the scientific method and measurement theory. Details see separate lab instructions. The professor in charge of the laboratory is Mr. Peacher.

Physics Learning Center (Tuesday & Thursday 2–4:30 and 6–8:30pm in 129+130 Physics – recommended). Run by the LEAD program, this is an open learning environment where you can work on your homework problems and get help from faculty and trained peer–learning assistants. Attending the PLC is voluntary, and there are no points associated with it. You may come at any time while the PLC is open.

Sources of Course Points and Grading

Exams. There will be three 60–minute tests given at **5:00pm** on the Wednesdays listed under *Class details* on JoeSS and a Final Exam given during Finals week. The exams are taking place in person; rooms will be announced later. Each of these four exams is worth 200 points. Your lowest exam score (out of the three tests and the final) will be dropped. **Do not come to campus if you are ill on a test day.** Contact Dr. Vojta to arrange a makeup. Makeup exams must be completed within ten days from the common exam date.

End–Material Test worth 50 points covering material presented after test 3 will be given concurrent with the Final Exam during Finals week.

Recitation. For graded recitation work, your instructor may give quizzes or collect in–class worksheets. There will be no excused absences from recitation, except for illness or university–sponsored events. In those cases, you need to contact your recitation instructor **before class** and await their instructions. Note: There is no set number of recitation assignments. The two lowest recitation scores will be dropped, and the remaining scores will be averaged.

Homework. You need to submit your solutions as pdf through your recitation course in Canvas. Homework will be selected for grading several times during the semester. The lowest homework score will be dropped. Your solution must follow the procedure outlined in the *Problem Solving Procedures*.

Laboratory Reports. You will have six laboratories during the semester. Your reports are to be turned in to your lab instructor after each of the labs. Lab reports will be graded on the basis of 100 points; the lowest lab score will be dropped. Each Physics 1135 student must purchase a lab manual. Students not purchasing a lab manual will receive a laboratory grade of 0.

Final Grade Composition:

Tests	60%	(The lowest exam score of four is dropped)
End–Material Test	5%	
Recitation	15%	(The two lowest scores are dropped)
Homework	5%	(The lowest homework score is dropped)
Laboratory	15%	(The lowest score of six labs is dropped)

Absolute Grading Scale: The grade cuts are (to four significant figures):

- **A** for 89.50% of total possible points
- **B** for 79.50% of total possible points
- **C** for 69.50% of total possible points
- **D** for 59.50% of total possible points
- **F** for less than 59.50% of possible points

The grade cuts are absolute and will not be lowered. Points will not be added to a student's grade to bring it above the cutoff.

Grades for recitations and labs will be posted separately on Canvas. The lab is not a stand–alone course. Periodically, we will incorporate the lab scores into the recitation gradebook. The course grade will be calculated through the gradebook on the recitation Canvas page.

Some Course Rules

If you participate in a major university or intercollegiate event on the day of an exam, you may request an alternate exam date. To do this, you must email a request to Dr. Vojta and provide an official note signed by the event's university sponsor, *no later than the Tuesday **the week before** the test*. You will receive an exam that is comparable, but not identical, to the one taken by the class. You must take the exam within ten days from the common exam date. If you fail to show up for your scheduled makeup, you will receive a grade of zero for the exam.

There are NO makeups of exams, recitation assignments, labs, or the end material test. If you miss any assignment, a zero will be recorded for that assignment. The only exceptions are illness or participation in a university–sponsored event; in those cases, you must contact Dr. Vojta or your recitation instructor **beforehand** and await their instructions. The two lowest recitation scores, the lowest homework score, the lowest lab score, and the lowest exam score will be dropped.

Your lowest exam score will be dropped. This accommodates students who under–perform on, or miss, one test for a reason beyond their control. If you did well on all three tests, you may decide to skip the final.

Requests for re–grades must be submitted no later than the next recitation after the general return of the assignment in class. Compose a detailed written statement on a separate sheet of paper explaining your request, attach it to the assignment, and submit it to your recitation instructor. The physics in your written argument needs to be correct. The entire problem will be re–evaluated; a serious mistake that was not noticed by the original grader *could* result in a lower grade than the one originally given.

Requests for gradebook corrections: In case a score is not entered correctly in the gradebook, notify your recitation instructor. Corrections must be requested no later than two weeks after the scores have been posted online. All requests for gradebook corrections must be made before the start of the Final Exam.

Communication: Contact information for all instructors is posted in the Course Information Module on the Canvas page for the lectures. We will try to respond to your emails within 24 hours during the work week. Announcements will be made through Canvas.

Students with too many missed assignments will be dropped. Any student who has missed a total of 5 assignments of any kind (tests, homework, recitation, and labs) can be dropped from the course. Students with 5 or more missed assignments will not be allowed to switch to Hearer status.

Student Honor Code and Academic Integrity: All students are expected to follow the Honor Code. Student Academic Regulations describe the student standard of conduct relative to the University of Missouri System's Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism, sabotage, and unauthorized use of artificially generated content, any of which will be reported to the Vice Provost for Undergraduate Education. Other resources for students regarding academic integrity can be found online.

Emergency exit: Egress maps for campus buildings can be found at Floor plans page

Appeals. In extremely rare cases, you may believe an exception to a course rule should be made. In this case, you may file a written appeal with your recitation instructor. Appeals must be filed within one week of the occurrence of the circumstance that causes your appeal, or by the end of your last recitation in the semester, whichever comes first. Your appeal will be carefully considered by the entire Physics 1135 teaching staff. This appeals policy applies to course rules given in this syllabus but does not apply to laboratories. Lack of preparation, non–emergency family events, oversleeping, forgetting a test date, or poor performance etc. are not reasons for filing an appeal.

Unresolved complaints about laboratory or recitation instructors. We hope that all conflicts can be resolved in a collegial manner through discussion between student and instructor. However, if such a situation continues or remains unresolved, please feel free to discuss it with Dr. Vojta. If you have complaints about your lab instructor, please contact the lab coordinator, Mr. Joel Peacher (peach@mst.edu).

Unresolved complaints about the course: I hope that we can resolve any complaints about the course through a direct discussion. Talk to me or email me at vojtaa@mst.edu. However, if there are any complaints that cannot be resolved, you may contact Dr. Dan Reardon, Associate Dean for Academic Affairs (reardond@mst.edu).

Class and exam cancellation policy. If classes are officially cancelled, a media advisory will be issued. If lecture is cancelled, the online version will replace the in–seat lectures for that day. It is not possible to reschedule an exam. If campus is closed during the time an exam would have been given, the exam will be cancelled and not rescheduled. The highest two scores of the remaining three exams will be used as the exam portion of the course grade. If campus is closed on the day before, or the morning of, an exam, do **not** assume the exam will be canceled – if campus is open at exam time, the exam will take place as scheduled.

Course assistance

If you have a disability and need accommodations, you need to request a letter from Student Accessibility and Testing (G10 Norwood Hall, dss@mst.edu) verifying your disability and specifying the accommodation you need and have this sent to Dr. Vojta before we can arrange your accommodation. **Testing accommodations require seven days' notice.**

Academic assistance is available in the Physics Learning Center and through the Student Success Center. Please contact your recitation instructor or Dr. Vojta if you have concerns or need additional assistance.

Title IX policies, resources and reporting options are available at Title IX Info.

Additional university policies are posted in the Course Information Module on Canvas.

Physics 1135 Schedule Fall 2025

Week 1: August 25 – 29

No Labs

Tues: Lecture 1 – Motion in One Dimension

- Position, velocity and acceleration in 1–D
- Read 1.1–1.6; 2.1–2.3, Syllabus

Wed: Recitation1; Homework #1 due

Thu: Lecture 2 – Motion in One Dimension

- Constant acceleration, free fall
- Read 2.4–2.6

Fri: Recitation 2; Homework #2 due

Week 2: September 1–5

No Labs. Labor Day Week.

Tues: Lecture 3 – Vectors and Motion in 2 Dimensions

- Unit vectors and vector components
- Vector addition
- Position, velocity, acceleration in 2–D
- Projectile motion
- Read 1.7–1.9, 3.1–3.3

Wed: Recitation 2; Homework #2 due

Thu: Lecture 4 – Motion in Two Dimensions

- Problem solving
- Read 3.5

Fri: Recitation 4; Homework #4 due

Week 3: September 8–12

Odd Lab 1: Capstone

Tues: Lecture 5 – Newton's 1st and 2nd Laws of Motion

- Force, mass, and acceleration. Weight.
- Read 4.1–4.4, 4.6, 5.1 –2

Wed: Recitation 5; Homework #5 due

Thu: Lecture 6 – Newton's Third Law of Motion

- Action–reaction pairs, coupled objects
- Tilted coordinate systems
- Read 4.5, 5.1 (Examples 5.1, 5.2, 5.4, 5.5)

Fri: Recitation 6; Homework #6 due

Week 4: September 15–19

Even Lab 1: Capstone

Tues: Lecture 7 – Friction

- Static and kinetic friction
- Read 5.3

Wed: Recitation 7; Homework #7 due

Thu: Lecture 8 – Circular Dynamics

- Centripetal acceleration
- Problem solving
- Read 3.4, 5.4

Fri: Recitation 8; Homework #8 due

Week 5: September 22–26

Odd Lab 2: Constant acceleration

Tues: Lecture 9 – Review

Wed: Recitation 9; Test Prep HW #1 due

Test 1 5:00 PM (Ch. 2 – 5)

Thu: Lecture 10 – Work

- Vector dot product
- Work done by a force, Work–KE theorem
- Read 1.10 (scalar product only), 6.1–6.4,

Fri: Recitation 10; Homework #10 due

Week 6: September 29– Oct 3

Even Lab 2: Constant acceleration

Tues: Lecture 11 – Mechanical Energy

- Conservative and non–conservative forces
- Potential energy and mechanical energy
- Read 7.1–7.3

Wed: Recitation 11; Homework #11 due

Thu: Lecture 12 – Energy Methods

- Force and potential energy
- Potential energy diagrams
- Read 7.4–7.5

Fri: Recitation 12; Homework #12 due

Week 7: October 6–10

Odd Lab 3: Friction
Tues: Lecture 13 – Static Fluids
- Pressure, Buoyancy
- Read 12.1 – 12.3

Wed: Recitation 13; Homework #13 due

Thu: Lecture 14 – Fluid Dyamics
- Continuity equation
- Bernoulli's equation
- Read 12.4 – 12.6

Fri: Fall Break. No Class.

Week 8: October 13–17

Even Lab 3: Friction
Tues: Lecture 15 – Universal Gravitation
- Kepler's Laws of planetary motion
- Universal gravitational force
- Satellite motion
- Read 13.1 – 5

Wed: Recitation 15; Homework #15 due

Thu: Lecture 16 – Universal Gravitational Potential Energy
- Universal gravitational potential energy
- Escape speed
- Read 13.8

Fri: Recitation 16; Homework #16 due

Week 9: October 20–24

Odd Lab 4: Impulse
Tues: Lecture 17 – Linear Momentum
- Impulse
- Conservation of linear momentum
- Explosions and Collisions
- Read 8.1–8.3

Wed: Recitation 17; Homework #17 due

Thu: Lecture 18 – Linear Momentum and Energy
- Energy in collisions
- Center of mass motion
- Read 8.4–8.6

Fri: Recitation 18; Homework #18 due

Week 10: October 27–31

Even Lab 4: Impulse
Tues: Lecture 19 – Review
Wed: Recitation 19; Test Prep HW #2 due
Test 2 5:00 PM (Ch. 6, 7, 8, 12, 13)

Thu: Lecture 20 – Rotational Motion
- Rotational kinematics; rolling
- Moment of Inertia
- Rotational kinetic energy
- Read 9.1–9.5, 10.3

Fri: Recitation 20; Homework #20 due

Week 11: November 3 –7

Odd Lab 5: Rotational Motion
Tues: Lecture 21 – Torque
- Torque
- Rotational dynamics
- Read 1.10 (vector product), 10.1–10.2

Wed: Recitation 21; Homework #21 due

Thu: Lecture 22 – Static Equilibrium
- Conditions for equilibrium
- Problem solving
- Read 11.1–11.3

Fri: Recitation 22; Homework #22 due

Week 12: November 10 –14

No labs this week.
Tues: Veteran's Day – No Lecture 23
Wed: Recitation 23

Thu: Lecture 24 – Angular Momentum
- Conservation of angular momentum
- Rotational collisions
- Read 10.5–10.7

Fri: Recitation 24; Homework #24 due

Week 13: November 17– 21

Even Lab 5: Rotational Motion
Tues: Lecture 25 – Review
Wed: Recitation 25; Test Prep HW #3 due
Test 3 5:00 PM (Ch. 9, 10, 11)

Thu: Lecture 26 – Periodic Motion
- Simple harmonic motion
- Simple and physical pendulum
- Read 14.1–14.6

Fri: Recitation 26; Homework #26 due

Week 14: December 1 – 5

Odd Lab 6: Waves
Tues: Lecture 27 – Wave Motion
- Transverse and longitudinal waves
- Traveling waves
- Doppler effect
- Read 15.1–15.5, 16.7– 8

Wed: Recitation 27; Homework #27 due

Thu: Lecture 28 – Interference
- Standing waves, interference
- Read 15.6–15.8, 16.6
- Read *End of Semester Information*

Fri: Recitation 28; Homework #28 due

Week 15: December 8 – 12

Even Lab 6: Waves
Tues: Lecture 29 – First Law of Thermodynamics
- Work by a gas
- Idea gas processes
- Read 18.1, 19.1–19.8

Wed: Recitation 29; Homework #29 due

Thu: Lecture 30 – Thermodynamic Cycles
- Heat engines
- Entropy and Second Law of Thermodynamics
- Read 20.1–2, 20.5–20.7 Standing waves, interference

Fri: Recitation 30; Homework #30 due

Finals Week: Dec 15–19

Tuesday, December 16, 7:30 am – 9:30 am
End Material Test (Oscillations, Waves, Sound, Thermodynamics)
Final Exam (Material covered in Tests 1, 2, and 3)