

Lectures: M,W,F 1:30-2:20 **ROOM:** 2025 SCI

Required Materials:

1. University Physics 1, 1st Edition,
<https://openstax.org/details/books/university-physics-volume-1>
2. i>Clicker2

LECTURER: W.J. Llope, Associate Professor
Physics Building, Room 347
wjlllope@wayne.edu
313-577-9805

ALCS FACILITATORS: Jon Troyer and Kevin Siehl
ALCS PEER MENTORS: Kamil Abu-Shaban, Amatullah Burhani, Dhruvil Patel

COURSE WEB PAGE: WSU Blackboard

OFFICE HOURS: (tentative) M: 12:00 PM - 1:00 PM or by appointment
Physics Building, Room 347
Facilitator's office hours will be in the PRC (times TBD)

LEARNING OUTCOMES: The learning outcomes for of this course, which are the traditional goals in Physics, are that you will be able to apply basic physical laws to analyze real-life or unstructured situations (“word problems”), both descriptively and numerically, for the aspects covered in this course. You should be able to analyze both existing situations, and situations that you or someone else want to construct.

LECTURES: These are given three times a week. Note that we will be covering roughly the whole textbook over the course of the semester. Thus, **the class pace will be quite fast**. This is not my decision - there is a certain amount of material that must be covered to fulfill the course's obligations to the physics and other departments that require this class. **If you fall behind, it will be very difficult for you to catch up. Basically you need to spend *at least* 4 hours per week (besides lecture and discussion section attendance) reading the textbook and working problems.**

The lectures, and also Blackboard, will be used to distribute announcements. During the lectures, the lecturer will present slides on the topic(s) for the day. Interspersed with these slides will be simple questions on the material that you will answer with your i>Clicker2. These i>Clicker2 results will thus provide information both on how well you are following the material, but also on your attendance. The lowest two i>Clicker2 scores will be dropped. The in-lecture i>Clicker2 results contribute 8% of your final grade.

Note that the style of these lectures is matched to the active community learning concept (more on this below). The primary goal of the lectures is to carefully explain the concepts. The lectures are not the place where problems will be solved step-by-step on a regular basis - this happens in the discussion sections. Problem solving will occasionally happen in lectures to walk you through the main steps that you should generally follow to get the problems right.

DISCUSSION SECTIONS (“ALCSs”): Discussion sections meet once per week. The goal of the discussion section is to enhance your learning and grades in the course. The discussion section uses the “learning communities” format. The physics department adopted this new style for the 2130/40/70/80-series of courses beginning in the Fall 2014 semester.

The discussion section will be divided into teams of 5 to 7 people and each team which work together in various ways every week. You will spend most of the time “doing”, not just watching and/or taking notes. This is called *active learning*. Active learning communities have expanded to physics courses in response to demand from previous students. There are several benefits from this format:

- Data show that active learning works. Other courses at WSU have repeatedly seen a 1% grade increase for *each* session that students attend. This amounts to a *one letter grade* improvement over the whole semester.
- They’re more fun
- You will learn more and remember more.

During the beginning of the first meeting of the discussion section, or Active Learning Community Session (ALCS), you will meet your group and get to know each other. From then on, the discussion section formats will be rather similar week-to-week. One regular activity will be to work on some of the homework problems relevant for the physics topic being covered that week.

For every session after the first, there will be a quiz, which will have questions and problems similar to the homework problems. These quizzes are a very important way for you to monitor your understanding of the material as the course progresses. They will be graded allowing partial credit. **You will need to show your work clearly in order to receive partial credit. Getting in the habit of showing your work clearly in these quizzes will be a great help to you on the exams. I see way too many students “equation hunting” then punching numbers into a calculator without writing anything down. This approach is not effective. In fact it’s bound to fail.** It will be *very common* for you to need to draw a simple diagram, and/or do some simple algebra with equations, before you get anywhere near your calculator.

The discussion grade will contribute 15% to your final grade: 10% for the total quiz scores after dropping your two lowest quiz scores, and 5% for attendance and participation. **No make-up quizzes will be given.**

ALCS	CRN 2170/2175	Room
T 1:30 - 3:20	12811/12236 (Sect 001)	0324 STAT
Th 1:30 - 3:20	14511/14510 (Sect 002)	0075 MANO
W 2:30 - 4:20	14513/14512 (Sect 003)	0065 MANO
M 2:30 - 4:20	10671/12238 (Sect 004)	0065 MANO
W 11:30 - 1:20	14516/14514 (Sect 005)	0069 MANO
M 11:30 - 1:20	14517/14515 (Sect 006)	0329 STAT

EXAMS: There will be three 50-minute exams in class during a lecture period, consisting of multiple choice questions (no partial credit). The lowest regular exam score will be replaced by your score on the Final Exam (if the final exam score exceeds the lowest regular exam score). Therefore, **no makeup exams will be given.**

You **MUST** bring your Wayne State ID to the exam and present it to a proctor when asked during the exam. No electronic devices other than a calculator are allowed in the room during the exam (no iPods, headphones, cell-phones, Blackberries, etc. Bring pencils of course.

The exams will be multiple choice on scantron sheets and graded by Scoring Services here on campus. You will also hand in the test booklet. The instructions for properly filling out the scantron sheets and test booklets may be found on the blackboard area for this class, and these will also be displayed on the screen at the beginning of each exam. You are strongly encouraged to not work the problems in your head, but use the provided white space in the exam booklets to draw diagrams and solve the equations. I have seen too many students “equation hunting” and this strategy will not work well for you. You will do much better if you carefully read the problem, draw diagrams, then take it step by step explicitly on paper. You are strongly encouraged to circle your answers in the text booklet too, as this will be what I grade in case the scantron sheet is lost by Scoring Services (this has not happened yet, but better safe than sorry).

There will be two versions of the exams and alternating students will get alternating exams. The exam problems on the two versions look very similar but have very slight changes, and the 5 answers possible are the same for both versions. Thus, **if you glance at your neighbors answers and pick the same answers as your neighbors, you are guaranteed, by design, to get that problem wrong!** The exams are not meant to be overly difficult, and I am certainly not trying to trick you. If you have participated in the material, and followed the keys to success described below, you will do fine on the exams.

Exams *may* be graded on a curve. I will decide this based on the average exam score. If the average score is above 65%, the scores will not be curved. If the exam scores are curved, the algorithm used sets the mean to a score of 70 (B–/C+) with a linear re-weighting such that no one exceeds 100%. Curving the exam scores only makes sense for small adjustments as stronger students benefit less than weaker students. In fact, curving

scores effectively penalizes the good students, so I will curve the exam scores only if it is truly necessary. You should assume in general that the exam scores will not be curved. The mean value of the (uncurved or curved) scores will be distributed to the class so you can see if you doing poorly or well with respect to your peers.

COURSE GRADING: Your course grade will be determined by your performance in the three in-lecture exams, the ALCS results (weekly quizzes and participation), the i>Clicker2 results from the lectures, and the Final Exam. The Final Exam will cover the material presented throughout the entire semester. The discussion section results contribute 15 points to your final score (see above). Questions will be presented in the lectures that you will answer using your i>Clickers. You will get one point for answering a question. These scores contribute 8 points to your final grade. This is nearly a full letter grade, so **it will really help you to attend every lecture and pay attention.** Participation is also graded explicitly in the discussion sections, so you need to attend every one of those as well. Participation in the discussion sections will also help you understand the material - that's the whole point of the discussion sections!

Thus, the overall course grade will be determined on the basis of the following distribution:

Three In-lecture Exams	45 points (15×3=45 points)
Final Exam	32 points
In-lecture i>Clickers	8 points
ALCS participation	5 points
ALCS quizzes	10 points
Homework	5 points (extra credit)
Total	105 points

The letter grade for the course will be based on the following scale (WSU default).

Grade	Cumulated Score	Grade	Cumulated Score
A	91-100	C	60-64
A-	85-90	C-	55-59
B+	80-84	D+	50-54
B	75-79	D	45-49
B-	70-74	D-	40-44
C+	65-69	F	0-39

As mentioned above, we have to cover roughly the whole textbook during the semester. This is not my decision. **It does mean that the class pace will be very fast, so do not fall behind.** Generally, the first slide for each lecture will be used to keep you up-to-date on the near-term plan. **That way, you will be able to read the appropriate textbook sections before the lecture in which they will be covered. This will help you a lot.** The class schedule shown just below is subject to change.

TENTATIVE CLASS SCHEDULE (Subject to change)

Date	Chapter
Aug 30 - Sep 25	1-6
Sep 27	Exam 1
Sep 29 - Oct 16	7, 8, 13
Oct 18 (T)	Exam 2
Oct 20 - Nov 13	9-12
Nov 15	Exam 3
Nov 17 - Dec 11	15-17

FINAL EXAM: The final exam will also be multiple choice. The final exam will be cumulative and also include the topics that were covered between the third regular exam and the final exam. The final exam date and time is determined by the University. It cannot be changed. Extra time (beyond the regular 80 minutes) will be allowed if the classroom is not needed by a different class.

FINAL EXAM: Monday, Dec 18 12:30 PM-2:30 PM 2025 SCI

LABORATORY: PHY 2171 is the laboratory portion, and is as a separate part of the course with its own grades and procedures which will be explained by your laboratory instructor. The experiments provide tangible demonstration and reinforcement of the ideas presented in this course. In addition, the laboratory is meant to show the importance of experiments in science. **The labs generally start in the third week of classes.**

HOMEWORK: Homework will be assigned in the WebAssign system. The class key to use to enroll in this class is **wayne 1492 2762**. Your total homework score will contribute up to 5% extra credit in your final grade.

It is highly recommended that you work all odd-numbered problems from the book as the course proceeds and check your work against the answers in the back of the book. That is because it is the homework problems that will give you the best idea on what the exams will look like and the best idea on how well you will do on the exams!

HONORS COURSE: An honors option is available for this course. If you decide to go for this, there will be homework problems assigned using the webassign system. Also required will be a short paper, 5-10, pages that you will write on a topic that is related to the course material and which you have discussed with the lecturer beforehand.

The specific requirements to register for honors credit is to fill out a form, signed by the lecturer, and turn in that form and two other documents to the university **no later than Sep 29**. The two other documents required are the course syllabus (this document), and *“a typed proposal identifying the additional assignment and explaining why this work qualifies for honors credit”*. The lecturer has provided this document, and it may be found

on blackboard.

You must get a grade of B or better in the regular class and B or better for the honors work to earn honors credit. Note - there is no penalty here. If you sign up for the honors version and decide to stop participating in that later on, this does not appear on your transcript.

STEM Commons: If you have difficulty doing the problems or lab work, or understanding some of the course material, you can get help at the STEM Commons. This is in the first floor of the Science and Engineering Library. The two TAs and three PMs each have two hours of office hours there per week. The times and days for these office hours will be provided in the lectures.

It is important to point out again that **the discussion sections are the best place to ask direct questions about how to work the problems.** That is what the discussion sections are for - and the TAs and PMs are there to help you.

TIPS FOR SUCCEEDING IN INTRODUCTORY PHYSICS: There is no secret to succeeding at Introductory Physics. The things you must do to achieve your best results are amazingly clear and should not be unknown to you. Previous experience with many, many students has shown the following traits and habits are common to the students that excel in introductory physics courses.

1. **Come to class.** At every university I have been associated with studies have been taken to find out what best predicts student success. Regular class attendance is the thing that is most associated with student success. Perhaps this is obvious, but many students do not show up and wonder why they are doing poorly.
2. **Get the book. Read it.** Use it. There are LOTS of very good hints and ideas in the Preface. Most students do not read the Preface, but in it the authors have given you their best advice on how to use the text successfully.
3. **Actually read the text.** This is preferably done before the class lecture, and if possible, afterward as well. Make sure you read the “Review & Summary” section at the end of each chapter. It is critical to summarize what you’ve learned.
4. **Put in the time.** The text book recommends (and we agree) that you should be spending at least 2 hours outside of the class for every hour of lecture. This is at least 4 hours per week. It is best to spend time both before class getting familiar with the material, and after class reviewing the material.
5. **Practice, practice, practice.** Do the assigned homework, do the extra credit problems, and do other book problems. You can watch Michael Jordan play basketball for 3 hours a day, every day, and you will never get better at basketball - not unless you yourself put in the time and practice.
6. **Strive for understanding.** Many students feel if they just “get the answer” from a TA or help center person, they have accomplished the task. This is incorrect. You have accomplished your task when you truly understand the problem, how to set it up, how to solve it, and what it is asking. Just completing the problem to get some

random answer is not enough. Realize that we provide you the formulas you will need, thus memorization is not terribly helpful.

7. **Attend your instructor's office hours.** This will be most effective if you bring your book and your homework problems and ask him/her to help you identify your trouble areas. Open-ended statements like, "I don't get any of it" will not be helpful in this setting.
8. **Do not fall behind.** The course pace will be fast and this is unavoidable. Attend the lectures. Read the textbook before each lecture. Do the homework problems before the discussion sections so you can ask better questions to the TAs. If you attend the sessions and stay current, you will earn all of the participation points and you will find that studying for the exams will be much easier and take less time.

TIPS FOR SUCCEEDING IN THE ALCSs: The goal of the ALCSs (or "discussion sections") is to enhance your learning and grades in this course. The ALCSs will not cover all of the topics covered in the textbook and will not cover all the topics discussed in the lectures. The focus is rather on the more important topics that have given trouble to students in the past. The ALCS grade will contribute to 15% of your final grade for this course. Of this, 10% is based on the weekly quiz scores and 5% is based on attendance and participation. It is important to note that the three exams that will occur during the lecture periods are based on the materials covered in the lectures and listed as homework problems. The weekly quizzes that occur in the ALCSs will cover the material covered in the previous week's ALCS.

One of the things you will notice here is that you spend most of the time doing, not watching. This is called "active learning" and it will help you to improve your understanding of the material and hence your final grade. In the past, for each hour in ALCSs, on the average, students have increased their course grade by 1%. Not too much for one class, but it can pay off very nicely over the semester. The basic concept is really quite simple. The weaker students learn from the stronger students, and the stronger students benefit from the process of trying to help explain part of the topic. Both the weaker and stronger students thus benefit, and generally students that may be weak on some topics are strong on others - so everyone will end up participating in the group nearly equally.

In your ALCS sessions, everyone will be divided into teams of 5 to 7 people each, which meet and work together every week. A "facilitator" (or "TA") and a "Peer Mentor" (PM) will be available to help guide the teams towards the solutions to the problems they are working on. The facilitator will not, however, simply work the problems on the board.

Each week we will spend some time on Physics learning activities - you will see many different types of activities. During the beginning of the first meeting, you will meet your group and get to know each other. There will be objectives for each ALCS and generally a brief review presented by the facilitator. One regular activity will be to work on the homework problems. An ALCS will generally be divided as follows:

- **15min** - quiz on last week's material.

- **15min** - quiz discussion (review the material and solutions), or possibly quiz retakes
- **10-20min** - facilitator presents objectives for this week, and perhaps a few review slides
- **30min** - team activities (this could be a worksheet or an activity with provided materials)
- **30min** - team homework (here the teams work together to solve 2-3 homework problems on today's topic)
- **5min** - wrap-up, attendance, A.O.B.

WHAT TO DO IF YOU'RE STRUGGLING WITH THE MATERIAL: It is certainly true that not everyone has a knack for physics. It does require some ways of thinking and approaching problems that can be rather different than other subjects. Physics has its own set of rules, and one really has to practice to get good at using them. It is also certainly true that not every student has taken a physics class before, or perhaps took one that introduced all the same subjects that will be covered in this class.

If you feel like you are falling behind, don't despair, but do take action. What you've been doing is not working for you so you need to change your approach. You may be studying "hard" but not efficiently. Here are some suggestions if you feel like you are struggling to understand the material.

- How's your attendance? Remember, pretty much a full letter grade is achieved simply by racking up the clicker points in lectures, attending all the discussion sections and actively participating, and not missing any quizzes.
- Have you opened the textbook? Are you reading the upcoming material before the lectures and discussion sections? If you do this, you will be able to ask much better questions in class and the slides you see in lecture will be much more useful to you.
- Are you participating in the discussion sections? If you do not understand something about a problem, did you sit there quietly or did you ask? Remember, the discussion sections are the main place to practice working problems. The TAs and PMs are there to help you! If you don't ask questions then, you are missing good opportunities to get help.
- If you need more direct help, you can go to STEM Commons. There are TAs there that can help you one-on-one, and it's free.
- The physics we discuss in this class is generally hundreds of years old, and a class like this one is taught at pretty much every university on the planet. There are thus many university websites, not to mention ones like Khan Academy and Physics Classroom, which explain the material in a different way, and you might benefit greatly from that. So, if you don't feel like you fully understand, say, momentum conservation, *google it!* You will find many many sites that explain the same topics with different approaches and with different pictures, and these could fill in some important missing piece in your understanding.

TIPS FOR COMMUNICATING WITH COLLEAGUES: We all have different personalities but a common goal - for everyone to understand the physics topics that will

be covered in this course. To achieve this goal, we will interact with each other in the lectures, in the ALCSs, and outside of lecture or discussion section sessions (*i.e.* via email or phone). To make these interactions as productive as possible, please follow these basic guidelines:

- **Emails to the lecturer or facilitator(s) should use proper english, and be respectful.** Messages such as “yo prof, ur office hrs, when?” are not likely to get a response - emails to a professor are not the same as texts to your friend (and also, in this case, that information was already made available to you and you didn’t bother to look for it!).
- **Please include “PHY2170” in the subject line of the email.** The lecturer gets hundreds of emails per day. By including these 7 letters in the subject line, you greatly increase the chances that your message is seen. Not all emails will get a direct response and may instead be responded to as a general announcement via blackboard, or at the next lecture or ALCS.
- **Inappropriate language or behavior in lectures, or when conversing with your teammates in the ALCSs, will not be tolerated.** It is unnecessary and unproductive. Engaging in this behavior will result in you being asked to leave the classroom, and may incur additional consequences. If there are personality conflicts within teams, the facilitator will rearrange the teams. It is your responsibility to behave in a civil manner and treat your teammates with respect.

STUDENT DISABILITY SERVICES: If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University. Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

ACADEMIC INTEGRITY: All forms of academic dishonesty are forbidden in this class. Examples of academic dishonesty include all variations of cheating during exams as well as changing test answers for re-grading. Continuing to write after the exam time is up will result in the grade of zero for that exam. All forms of academic dishonesty will be prosecuted to the fullest extent as outlined in the Student Due Process Policy of the University.

Excerpts from the University's Student Due Process Policy regarding disruptive behavior are outlined below. This policy will be enforced during all academic activities relating to PHY 2170/5 especially lecture and discussion classes. **A student who is being disruptive in discussion class will lose 10 points per occurrence from their total score. A student who is disruptive during lecture runs the risk of losing one exam score. Repeat offenders will have their course grade down-graded and if necessary, they will receive an F for the course. Lastly, a student may be brought before the Dean of his or her College for further action.**

The most important consequence of cheating/plagiarism or any other form of academic dishonesty, whether or not it is detected, is that you will not be able to do the work, and moreover you will not have the confidence that you can do that part of the course work. The ability to step up in the outside world and say with confidence, "I can do that" is surely one of the primary benefits of a college-level course, and is the source of many of the other benefits. You may "get away" with cheating once or even more than once, but the main penalty, far worse than any grade punishment, is that your college education, which is one of the best things you can do for yourself, will not have the benefits it could have given you.

Wayne State University STUDENT DUE PROCESS POLICY

1.0 PREAMBLE

1. As provided by the Board of Governors in WSUCA 2.31.01, "Student Rights and Responsibilities," and as mandated by academic tradition, the students of Wayne State University possess specific rights and responsibilities. Students are expected to conduct themselves in a manner conducive to an environment, which encourages the free exchange of ideas and information. Students, as integral members of the academic community, have the right to the assurance that their rights are protected from arbitrary and capricious acts on the part of any other member of the academic community. This Student Due Process Policy is designed to assure that students who are alleged to have engaged in unacceptable conduct receive fair and impartial consideration as specified in this policy.

4.0 PROHIBITED CONDUCT

The following conduct is subject to disciplinary action when it occurs on University premises, or in connection with a University course or University documents, or at a University-sponsored activity:

4.1 All forms of academic dishonesty.

4.3 Physical abuse of another person, or conduct which threatens or endangers another, or verbal or physical threats which cause reasonable apprehension of harm.

4.6 Disorderly behavior that interferes with activities authorized, sponsored, or permitted by the University such as teaching, research, administration, and including disorderly behavior that interferes with the freedom of expression of others.

5.0 DISCIPLINARY SANCTIONS Students found to have committed an act, or acts of misconduct may be subject to one or more of the following sanctions, which shall take effect immediately upon imposition, unless otherwise stated in writing, except as provided

in this policy.

5.1 Disciplinary Reprimand. Notification that the student has committed an act of misconduct, and warning that another offense may result in the imposition of a more serious sanction.

5.2 Disciplinary Probation. A disciplinary status which does not interfere with the student's right to enroll in and attend classes, but which includes specified requirements or restrictions (as, for example, restrictions upon the student's representing the University in any extracurricular activity, or running for or holding office in any student group or organization) for a specific period of time as determined in the particular case.

5.3 Suspension. A denial of the privilege of continuing or enrolling as a student anywhere within the University, and denial of any and all rights and privileges conferred by student status, for a specified period of time. At the termination of the suspension the student will be entitled to resume his/her education without meeting any special academic entrance requirements.

5.4 Expulsion.

5.5 Restitution.

5.6 Transcript disciplinary Record.

5.7 Other Sanction.

10.0 PRELIMINARY PROCEDURE

10.1 When a faculty member is persuaded that academic dishonesty has occurred, the faculty member may, without using the mechanism of filing a charge, adjust the grade downward (including downgrading to a failing grade) for the test, paper, or other course-related activity in question, or for the entire course.