Physics 152[1]
Principles of Physics II
Spring, 2024

Meets:
8:00 am – 9:50 am
Mon., Wed., Fri.
150 Meldrum Hall

Instructor:
Dr. Christopher Cline
278 Meldrum Hall
Chat/call me on Microsoft Teams
ccline@westminsteru.edu

Conditions of enrollment: A passing grade of C- or better in Math 144 (or Math 143 or Math 141/Math 142), and Phys 151 or Phys 211 are prerequisites for all students enrolled in this course.

Textbook:

Required: *Workshop Physics Activity Guide*, Modules 2, 3, & 4, Priscilla W. Laws

Free & online: Readings will be provided on Canvas
Videos from *Crash Course Physics* with Dr. Shini Somara and PBS Digital Studios

How to get help: My *office hours* are M-Th 1:00 pm - 4:00 pm. If you can't come during any of these hours, I will be happy to make an appointment with you for another time. For me, *the* most enjoyable aspect of teaching is working with students one-on-one. *Please, please* come see me often—*especially* if you run into difficulties with concepts.

Course Description and Philosophy

Course Objectives and Goals:

1. Development of Transferable Scientific Skills
    a. Ability to work well in a group
    b. Research and development skills
        i. Development of conceptual understanding through observation of physical phenomena
        ii. Reasoning about physical phenomena on the basis of available evidence
        iii. Use of experimental data in the development, testing, and refinement of theoretical models
        iv. Evaluation of data sets containing extraneous information and/or noise in regard to identifying relevant/important information.
        v. Experimental design
        vi. Scientific writing ability
2. Applying course material in quantitative problem solving
3. Increased comfort in using educational technologies

Physics: From the practical to the profound: Physics is ***not*** a large collection of facts or formulas to be memorized. Physics is also not the dreaming up of theories in the absence of data, or the exposé of truth, whatever that means. Physics is not mathematics; in physics, math is demoted from the wonderful art that it is to a necessary tool for dealing with quantitative predictions and data treatment. And the laws of physics do not command objects to behave in certain ways.

Physics is a science that attempts to unify elements of the natural world by means of observation, mathematics, and the use of precise language. Using methods developed by physicists, we can describe many events that occur in our everyday lives. The principles of physics provided a basis for most of the technologies that are an essential part of modern life. In this sense, physics is *practical*. Many laws developed by physicists, such as the law of conservation of energy, are of tremendous practical importance. These same laws also help physicists understand the very tiny constituents of matter as well as the motions of giant clusters of galaxies. Thus the study of physics helps us understand some fundamental relationships between the matter in our surroundings and the evolution of the universe. In this sense physics is *profound*. You are about to begin your own exploration of the natural world using some of the concepts, tools, and methods commonly employed by physical scientists. Thus, you are beginning what we hope will become a grand journey from the practical to the profound that will continue long after you have completed introductory physics.

[1] Portions of this syllabus have been adapted from other instructors, including Dr. Priscilla Laws (Dickinson College), Dr. Karen Cummings (S. Connecticut State Univ.), Dr. John Mallinckrodt (CS-Pomona), Dr. Robert Talbert (Grand Valley State University), and Dr. Julia Kamenetzky (Westminster University).

The Workshop Physics Philosophy

I hear, I forget.
I see, I remember
I do, I understand
Anon

In traditional science courses, attending lectures, reading a textbook, and solving problems are the primary learning activities. These activities are usually supplemented by a weekly laboratory session taught by an instructor other than the lecturer. The emphasis in traditional courses is on *what* you know.

Physics 152 will be taught using the award-winning Workshop Physics method developed by Dr. Priscilla Laws of Dickinson College and used at hundreds of colleges and universities across the country. The workshop method is based upon the simple principle that understanding comes not from listening but from doing.

At its heart, physics is a science that is based upon experimentation; physics was developed through a process of observation, prediction, and refinement through further experimentation. In this course we will take a very similar approach. Instead of reading and memorizing the laws of physics from a textbook (and taking someone else's word for it that they are correct), we will seek to discover and verify them for ourselves during in-class activities. We'll use a whole host of high-tech tools such as computer driven sensors, video software, and spreadsheets to both acquire and analyze data. Abstract physics concepts will make much more sense when you can plot data instantaneously on the computer and model them using Excel. Your learning will go beyond simply memorizing physics equations; you will develop a conceptual understanding of physics as well as concrete reasoning and computer skills that will be useful in any other science course that you take. The critical question in this course is not "What do you know" but rather "*How* do you know what you know?"

Finally, let us emphasize that you are not losing anything by not being taught in the traditional lecture format - quite the contrary. Students who have completed workshop based general physics courses have been shown to perform far better than their peers who have gone through traditional courses. Workshop physics students demonstrate a far better overall understanding of physics, and, although it may seem surprising, their ability to solve traditional textbook problems is also superior. We truly believe that you will find workshop physics to be an enriching, rewarding, and, we hope, an enjoyable experience.

Written and Oral Work

Grading:

Your grade will be based on a professional judgment of your work using the following weighting scheme:

15%	*Written Homework*
10%	*Activity Guide Entries*
10%	*Course Engagement*
15%	Readings on Perusall
30%	Foundational Skill Goals
20%	Advanced Skill Goals

Your final letter grade will be determined from percentages in the following manner:

93 to 100	A	80 to 82.9	B –	67 to 69.9	D +
90 to 92.9	A –	77 to 79.9	C +	63 to 66.9	D
87 to 89.9	B +	73 to 76.9	C	60 to 62.9	D –
83 to 86.9	B	70 to 72.9	C –	0 to 59.9	F

Readings on Perusall: We can think of learning as a two-stage process: 1) information transfer, then 2) making sense of and assimilating the information. The second step is harder; that's what we'll do in class time. The information transfer step is what you'll do by completing the free course readings; you'll get your initial exposure to the concepts, equations, and techniques during the readings, and we'll make sense of them together in class. We'll use an app called Perusall to turn the reading process into a social, collaborative effort. From Perusall:

> *If you have a question or information to share about a passage in the readings, highlight the text and type in a comment as an annotation. You can also respond to a classmate's annotation in threads (Facebook style) in real time or upvote questions you find helpful. Good annotations contribute to the class by stimulating discussion, explaining your thought processes, helping others, and drawing attention to good points. If a particular classmate's point is relevant, you can explicitly "mention" them and they will be immediately notified, even if not presently signed on.*

It is nearly useless to read a physics text as you would a novel. "Studying" such a text requires that you be an active reader, that you remain engaged in a virtual and appropriately skeptical conversation with the author. You should, for example: (1) reserve doubt about everything the text says until it thoroughly convinces you, (2) think about situations to

which the author's arguments might not apply, (3) make notes in the margins or electronically, (4) draw your own sketches and graphs to help visualize situations and functional behaviors, and especially (5) fill in all the missing steps in any mathematical arguments. Indeed, it is all too tempting to simply take the author's word for everything including the results of any calculation; after all, he or she wouldn't consciously lie to you, right? Well, yes; probably. But if you get into that habit, you will become a passive reader. Your mind forms no permanent "hooks" on which to store the information being presented. The time spent in the process may well be reduced but will also have been essentially wasted.

Perhaps mathematician Paul R. Halmos gave the best advice about how to study: "Study actively. Don't just read the text; fight it! Ask your own questions, look for your own examples, discover your own proofs." (I Want to Be a Mathematician, New York: Springer-Verlag, 1985)

Each reading assignment will be due at 9 pm the evening before class, though some class days will not have their own reading assignments. You can continue to respond to existing comments and questions for full credit for 1 week after the deadline. You can also make new annotations for 1 week after the deadline, but credit declines linearly during this period. To allow for extraordinary circumstances (including absence for any reason), I will drop your three lowest scores from Perusall.

Each reading is scored out of 3 points and is scored based on some of or all the following behaviors that are shown by research to predict better performance in the course:

- Contributing thoughtful questions and comments to the class discussion, spread throughout the entire reading (*see some scoring examples*)
- Starting the reading early
- Breaking the reading into chunks (instead of trying to do it all at once)
- Reading all the way to the end of the assigned reading
- Posing thoughtful questions and comments that elicit responses from classmates
- Answering questions from others
- Upvoting thoughtful questions and helpful answers

Sometimes the in-class readings have a summary video associated with it from the *Crash Course Physics* series with Dr. Shini Somara and PBS Digital Studios. There is a link to the videos on the *Class Resources* web page, under "**General Resources**".

***Activity Guide Entries*:** An Activity Guide has been developed to support the Workshop Physics approach to learning. In-class written work will consist primarily of documenting your class activities by filling in the entries in the "activity" spaces provided. You are encouraged to keep your own notes in the margins of the Activity Guide. *You should not make a practice of waiting until after class to fill in your guide*. Some corrections to the Activity Guide pages are available on the class resources web page; your entries should be updated before each class period.

Activity Guide entries describe observations, derivations, calculations, and answers to questions. In the guide, a group of numbers signifying the unit, section, and activity number followed by the bold word **Activity:** (e.g. **16.3.2. Activity: Converting Between Temperature Scales**) indicates that a series of entries using data, words, sketches, or graphs is requested. Although you may use the same data and graphs as your partner(s) and discuss concepts with your classmates, all entries should reflect *your own understanding* of the concepts and the meaning of the data and graphs you are presenting. *Thus each Activity Guide entry must be written in your own words. Students who copy Activity Guide entries from current or old Guides will be reported for plagiarism*. The first such occurrence will result in a score of zero on that entry; the second occurrence will result in failure of the course.

Grading of Activity Guide Entries

You will occasionally be asked to submit the relevant Workshop Physics Activity Guide book for review, usually at the same time a homework assignment is due. Your instructor will examine all units since the last check (usually three units at a time) for completeness and quality, but not necessarily the accuracy of your understanding of the physics. It is ultimately your responsibility to see that your entries reflect a sound understanding of the phenomena you are observing and analyzing. Scores will be awarded based on using complete sentences, clear expository writing, proper labeling of graphs and tables, the use of appropriate units with numbers, inclusion of calculations, the expression of results to the correct number of significant figures, and adherence to instructions. Each unit will have a selection of questions graded for accuracy. For additional information, see the document "*Activity Guide Grading Rubric*".

To discourage late work, the grade for completion will be reduced by 10% for each day or part of a day after the due date unless an extension was previously given by the instructor.

***Homework Assignments*:** There will be a home assignment to complete for each unit; the assignments will be available from your instructor's web page. Some of the homework assignments will consist of questions based on class activities, while others are fairly difficult mathematical problems. Some of these may be adapted from problems in your textbook.

Sometimes you will need to finish activities you started during class before starting the homework. At times you will need to use software (Excel or Logger Pro) to do computer assignments; all software is provided to you for free by download or through Westminster Anywhere. At times you will need to come back to the classroom to do computer assignments. This out-of-class work will typically take 2 or more hours to complete after each class session. A typical student can expect to work about 6 to 8 hours each week out of class and spend anywhere from 15 to 60 minutes on each homework problem.

What is the Purpose of Regular Homework?

There are two reasons why we assign homework on a regular basis. First and for most, doing regular exercises right after class activities helps you clarify, retain, and extend the concepts developed during in-class activities. Our research has shown that students who do well-designed homework exercises on a regular basis learn much more physics than those who don't. The second reason for the homework assignments is to help both you and your instructors assess your progress in the course on a regular basis. For this reason, we grade the homework so we can give you continuous feedback.

We have noted in the past that there is a strong correlation between the steady effort needed to successfully complete homework and performance on examinations.

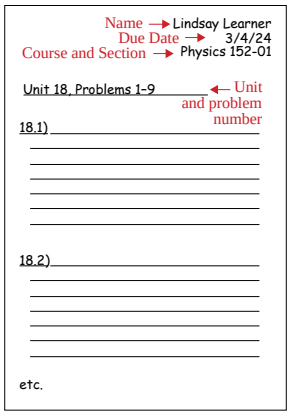
It is often difficult for beginning physics students to appreciate that the primary purpose of assigned problems in physics is *absolutely not* to see if you can get the right answer. Rather, it is for you to practice and then demonstrate that you have learned 1) how to *determine* the fundamental physical principles that are involved in a described situation and 2) how to *apply* those principles in a *disciplined* and *orderly* fashion. Of course, if you have learned how to do these things, you should expect to get the right answer too, but that is - *really* - of secondary importance. You will find - indeed, you probably *have* found - that, given time, an open book, lots of worked examples, and knowledge of the correct answer, it is very often possible to "get the answer" without the slightest understanding of what you are doing. Please guard against this; it is a *complete* waste of your time because it does not prepare you for, and it obviously will not work on, exams.

Accordingly, we are not - and *you* should not be - satisfied with problem "solutions" that simply consist of a series of mathematical manipulations leading to a result. Instead, your problem solutions should be "presented." By this we mean that they should be readable by someone who does not have access to the problem statement; should include written explanations and thoughtful comments about *what* you are doing and, especially, *why*; should use well-defined and consistent notation (employing unique and meaningful subscripts and superscripts as necessary); should be accompanied by neatly drawn and carefully labeled diagrams; and should flow in a logical and orderly progression down the page. They should use more space for the written explanatory information than for the mathematics! They should *not* include lengthy, multiple-step, purely *mathematical* manipulations because it only serves to *obscure* the physics. Do this kind of work on scratch paper and simply say something like "solving this equation for *v*, substituting the result into the equation for *F*, and simplifying we obtain..."

Handwritten Homework

Homework is due by 5:00 *p.m. two days after the Unit work is completed, or on the following Monday if the due day falls on a weekend* (*or an exam day*). For example, if a particular unit is finished in class on Monday, the homework is due by 5:00 p.m. on the following Wednesday. If a unit is finished in class on Friday, the homework is due by 5:00 p.m. on the following Monday. Late homework takes teaching assistants and instructors much longer to grade. To discourage late work, the grade on the homework will be reduced by 20%, unless previously arranged with the instructor. After one day, *no more late homework will be accepted*, as the solutions to the homework will be posted at that time so that other students may review them.

All homework will be emailed to your instructor as a PDF file. Handwriting your homework on 8 1/2" $\times$ 11" sheets of paper will likely still be the most convenient for you. Some students choose to type the majority of their assignment and insert pictures of handwritten drawings or mathematical work directly into their document; this is acceptable as long as everything is submitted as one PDF. Excel files may also be included in your email submission; make sure all your homework files are part of one submission. The number of each exercise in the assignment should be listed to the left of each answer. All contents of a problem must appear in order; for example, do not attach a printed graph to the end of your homework if it belongs with a question that appears in the middle. Also, all problems should appear in order. A sample of the format is shown to the right.



Grading of Homework

There will typically be between 5 and 10 problems for each homework assignment. The problems will be a mix of conceptual questions that will require a short essay, and mathematical problems (which will include problems where data is collected and/or analyzed using the computer). Some problems may only be graded for "honest effort", but not as to whether they are correct or not. Homework will be graded holistically using the provided rubric, on a 10-point scale. The rubric focuses on accuracy of the physics concepts, written explanation, presentation of mathematics, and completion. Solutions to the problems for each homework assignment will be provided on the *Homework Assignments* web page.

In the case of mathematical problems, a properly worked problem should contain:

- A brief description of the physical situation in clear, grammatically correct English.
- A list of the known and unknown quantities (with proper symbols, significant figures, and units).
- A running narrative, with complete English sentences, describing the step you take in solving the problem. The narrative should also include a description of the physics concepts being used (i.e. Newton's 1st Law, Conservation of Energy, etc.).
- Diagrams or drawings of the physical situation (graphs, free-body diagram, etc.).
- A list of the equations used, in symbol form.
- The equations solved in symbol form before substituting in any numbers. (You'll get better and better at this, we promise, but you must practice.)
- Calculations shown with the numbers substituted into the equations having the correct units and number of significant figures.
- The final answer clearly shown (usually with a box around it), with the correct units and number of significant figures.
- A check of the final result to make sure that it makes sense (*e.g.*, having a snail crawling at 25 m/s would indicate a mistake was made somewhere).

For additional information, see the document "Problem Solving Steps and Rubric" on the *Class Resources* web page, as well as the "*Homework Grading Rubric*". Homework will usually be graded by your instructor, but also on occasion by an upperclassman who has taken introductory physics. Your grader may occasionally make an error in judgment or a mistake. *If you think this is the case, feel free to ask the instructor to review your homework assignment*.

Late Homework

Homework solutions will be posted on the *Homework Assignments* web page one day after the homework due date. **No late homework will be accepted after the solutions are posted**. In cases where you have an extended illness lasting more than three class periods *with a note from student services*, you may negotiate a due-date for your make-up homework with your instructor.

Extra Credit for Solution Review and Reflection

A "good" score on an assignment does not necessarily mean that the problems were done correctly. It is the student's responsibility to make sure that they understand all the problems. Solutions to the problems for each homework assignment will be posted on the *Homework Assignments* web page; it is the student's responsibility to compare their assignment to the solutions and correct their own work. Though solution sets are not allowed to be used during the exam, your own handwritten corrections and notes are allowed. You may compare your graded homework to the solutions and submit a written, audio, or video reflection explaining what you missed and how you could improve the assignment. Don't just copy the solutions; explain in complete sentences what you missed, *e.g.* "I forgot to write the units in each step" or "I solved the the problem assuming [this] but I should have considered [that]…" A complete reflection will earn you up to 1 additional point on the homework assignment (not to exceed 10 points). Homework reflections are due at the same time as the next unit's homework, OR the day before an exam that uses that unit's homework, whichever comes first.

Foundational and Advanced Skill Goals: The skills that you learn in class and practice on the homework will be assessed via in-class, proctored questions; like quizzes and exams. Unlike "normal" quizzes and exams, they are graded pass/fail; you have either demonstrated that you have achieved the goal, or you have not. They are split into two categories: Foundational Skill Goals, that I expect all students to achieve, and Advanced Skill Goals, that I expect all students to at least attempt. Based on the grade weighting above, passing most of the Foundational Skill Goals is required to pass the course with a C-. Each Foundational Skill adds about 2% to your total course grade (in the end). Passing some or most of the Advanced Skill Goals is required for a B or A; in the end, each Advanced Skill adds about 2.2% to your total course grade.

Foundational Goals **may** be assessed during the last 10-20 minutes of class at any time after that unit's homework has been turned in. (Yes, it's basically a pop quiz.) Advanced Goals, and any remaining Foundational Goals, will be assessed

at the class times listed on the schedule. You may use a calculator. You'll also be provided one 8.5"x11" piece of paper that you can write on with your own notes for quizzes. Keep that note sheet updated frequently and bring it to class every day! If you fill up your sheet too soon, you may request a new note sheet from me once. Occasionally you may also be allowed to use Excel and/or Logger Pro. If you are absent when a Skill Goal is assessed, please be in contact with me ASAP to make it up in a timely manner.

Grading of Skill Goals

Your work for each individual skill will be assigned one of the following grades:

- AG for Achieved Goal: The student has demonstrated that they have achieved this learning goal. Minor mathematical errors are allowed.
- P+ for Progressing Plus: The student is almost there, but there is at least one notable error in understanding that must be corrected. The student is eligible to convert this P+ into an AG through the Redo Request form described below; they do not have to redo a new problem.
- P for Progressing: Some understanding of the learning goal is demonstrated, but the student could benefit from studying this topic more.
- U for Unknown: Not enough understanding has been demonstrated to assess.

Only "Achieved Goal" is worth credit for the Skill Goal.

Redo Requests

Because of the high standard for passing each skill, I am building in opportunities to try again into the course. However, a redo is not granted "for free!" For each skill goal that you want to redo to earn credit, you will need to fill out the Redo Request form that is available on Canvas that consists of the following prompts for P+ or P score:

- Describe your original thought process.
- What was wrong with your original thought process?
- What is the correct solution?
- How has your thinking changed?

The prompts are different for Unknown scores and will require an in-depth demonstration of your understanding as gleaned from previously completed readings, in-class activities, and homework assignments.

Please do not rely on redo requests to pass the course; they will add up quickly and it is more work to earn the redo than to study well for the first attempt. Always try your best for the first attempts; redos are a backup in case something goes wrong.

A preliminary list of the Foundational Skills and Advanced Skills are shown below. The numbers correspond to the units they are associated with (e.g. F.2 is a foundational skill that is part of Unit 2).

Preliminary List of Foundational Skills (each skill will be worth ~2.0% of the final grade)

- F.14: Relate a graphical (*e.g.*, position vs. time) and mathematical descriptions of periodic motion, accurately identifying amplitude, rotational frequency, frequency, period, and initial phase and how changes to the system can change these quantities (or vice versa).
- F.15a: Use superposition to show the resultant wave when two waves overlap.
- F.15b: Apply the law of reflection for flat mirrors to draw a diagram showing how light rays travel from an object to the eye to allow you to see an image in a plane mirror.
- F.15c: Determine the direction light will bend relative to the normal when passing from one transparent material to another.
- F.15d: Use the principal rays in a ray diagram to determine the location of an image knowing the location of the object, and vice versa.
- F.16: Qualitatively or quantitatively describe how mixtures of substances will achieve thermal equilibrium (with no phase changes).
- F.17: State the first law of thermodynamics and the ideal gas law and apply them qualitatively to a physical process.
- F.18: Define and distinguish in practice (with descriptions in words or with a Pressure-Volume diagram) the main types of thermodynamic processes: isothermal, isobaric, isovolumetric, and adiabatic.
- F.19: Apply Coulomb's law, with correct vector notation, to find the net electric field at a point given a distribution of charges or vice versa.
- F.20: Define electric flux at a surface and qualitatively compare fluxes in various scenarios.
- F.21: Draw the electric field lines given a set of equipotential surfaces or vice versa.

- F.22: Draw simple and accurate circuit diagrams of real-life circuits or vice versa (use a circuit diagram to create a real-life circuit) and predict or describe what the circuit will do in practice. LIST ELEMENTS USED
- F.23: Calculate the equivalent resistance of a network of resistors that may involve combinations of series and parallel combinations.
- F.24: Identify the variables that affect the capacitance and how each affects the capacitance.
- F.26: Use the right-hand rule and vector cross product to determine the magnitude and direction of a force exerted on a charged particle by a magnetic field.

Preliminary List of Advanced Skills (each skill will be worth ~2.0% of the final grade)

- A.14: Solve for unknown quantities given information about an oscillating system.
- A.15a: Use Snell's Law to find the angle of refraction or the critical angle for total internal reflection (TIR) for light traveling from one transparent material to another.
- A.15b: Apply the thin lens equation and definition of magnification to a thin lens to find the object distance, image distance, and/or focal length.
- A.17: Quantitatively apply the first law of thermodynamics and the definitions of latent and specific heat to a system that may include multiple phase changes, mixtures of substances of different temperatures, thermal energy transferred to a system, and work done by a system.
- A.18: Analyze a simple heat engine cycle of an ideal gas to estimate thermal efficiency and work as a function of pressures and temperatures at various points in the cycle, including solving for unknown pressures and temperatures using previously derived relationships between quantities.
- A.20: Justify the use of Gauss's law conceptually and quantitatively apply it to a distribution of charges to solve for the electric field as a function of position.
- A.22: Make qualitative predictions about the brightness of bulbs in circuits that may involve series and parallel elements, switches, and short circuits.
- A.23: Apply Ohm's law and Kirchoff's laws to a circuit that may involve multiple loops, wires, resistors, and batteries.
- A.24: Quantitatively analyze the time-dependent behavior of an RC circuit.
- A.26: Use the force on a charged particle and the properties of uniform circular motion to relate the motion of a charged particle to magnetic field properties.

Policies and Expectations

Before coming to each class session: You should have completed the Activity Guide entries from the previous class session (hopefully in the previous class), corrected typographical errors in your Activity Guide for the next session, and done the assigned reading from the text or other documents, as listed in the *course outline*. You are also *strongly* encouraged to have attempted to do relevant portions of the assigned *homework*.

You are expected to show respect for others and their ideas.

During class sessions, your willingness to discuss ideas with classmates, devise clever ways to measure or observe things, and make brief presentations using the board at the front of the classroom are important aspects of your participation in the course.

You are expected to be always participating actively in the class sessions.

The use of the computer during scheduled class periods is restricted to course related activities. In particular, reading and sending personal e-mail, working on materials for other courses, creating personal documents, and playing computer games will be detrimental to your course engagement grade and could affect your understand of the course material.

Arriving Late to Class: You are expected to show up for class on time. Coming to class late is both inconsiderate and distracting to your instructor and fellow classmates. Repeatedly coming to class late will be detrimental to your class engagement grade.

***Attendance*:** If you are in the habit of skipping class occasionally, you should think carefully about taking this type of course. Absences create real difficulties, since practically all the work done in the class requires the participation of two or more partners, and occasionally, special equipment.

You can make up the work if you have a legitimate excuse for your absence. If you are permitted to make up an absence, try to get one of your lab partners to help you do the work. If that is not possible, I will do my best to help you get it

done. However, under no circumstances should you copy data, graphs, or anything else if you were not in class to do the work. If there are reasons you cannot attend class, and you know about it ahead of time, please let me know before that class meeting. The nature of this class is such that you will do poorly if you skip class, because your grade depends to a great extent on what you do in class. It is not possible to skip class and "do the reading" or "get the notes" to make up for your absence.

***Cell Phones*:** You will be expected to turn off all cell phones and pagers while in class, and store them out of sight in your bag or backpack. The noise produced by cell phones and pagers, as well as the activity of emailing and text messaging, is very distracting and is a detriment to the learning environment.

Athletics: Athletes who anticipate potential conflicts should see the instructor during the first week of the semester to make arrangements for making up missed classes.

Making Up Excused Absences: Any class period missed for which there is a legitimate excuse must be made up at a time arranged for in advance.

Respect for Equipment: We expect you to be careful with the lab equipment and to keep your lab table clean and neat. At the end of every class period your table should be left with equipment arranged neatly, computer equipment off, and scrap materials thrown away.

Academic Integrity: You are encouraged to discuss and debate the ideas in any of your readings, in-class activities, and homework assignments with your instructors, TA's, lab partners, and other classmates. **However, you are not allowed to post your problems to the internet to be solved and are not permitted to solicit answers to assignment problems from any source outside of our class.** It is against class policy *and* copyright policy to use any "answer sharing website" such as Chegg to search for the resolutions to your homework or exam problems. Furthermore, discussion and collaboration is *not* allowed on exams.

If you work on assignments cooperatively, rather than independently, you may share ownership of spreadsheet, graph, and diagram files based on data you have taken with partners. However, *any other spreadsheet or written assignments must be expressed in your own words* and reflect your own format details. Thus, you may not copy from *any* source (even with some modification) problem solutions or spreadsheet assignments, Activity Guide entries, or written material on examinations. *If there is reasonable evidence of copying as determined by the instructor, it will be construed as an act of plagiarism. The first such occurrence will result in a score of zero on that assignment and notification to the Dean of Students; the second occurrence will result in failure of the course.*

Please make sure that you have read and fully understood Westminster's Policy on Academic Honesty (and Dishonesty) (as listed in the 2023-2024 *Westminster Academic Catalog*). My sincere desire is to act as facilitator - not an enforcer! - for your studies in physics. Accordingly, I operate on the assumption that all of our interactions are based on openness, honesty, and good faith. I expect all of us to be honest and to treat each other fairly and with respect. Because our trust in each other is absolutely *crucial* to the effectiveness of our relationship, I take an uncompromising stance, as should you, on the necessity for sanctions when it is violated.

Grading Errors or Changes: If you feel that there is an error in the grading of any assignment or exam, please bring it to my attention immediately. However, I reserve the right to take at least 24 hours before I respond to the query.

Pronouns, Correct Names, and Inclusion: It is your right to be identified by your correct name and pronouns. I support people of all gender expressions and gender identities and welcome students to use whichever pronouns or names that best reflect who they are. In this spirit, I expect all students to also use the correct pronouns and names of classmates. Please inform me if my documentation reflects a name different than what you use and if you have any questions or concerns please contact me after class, by email, or during office hours.

The scientific enterprise does not have a "clean record" with regards to respecting, including, and encouraging people from all backgrounds. There are many stereotypes floating around our cultural narrative about who can or should be a scientist/engineer. It is very important in this class to value the contributions from every student and encourage one another to rise to the challenge of the tasks ahead of us this semester.

Your rights under federal law

Section 504 of Rehabilitation Act of 1973/ADA: Westminster University is committed to providing equal access in higher education and to creating a learning environment that meets the needs of its diverse student body. If you are a student with a disability, or you think you may have a disability, we encourage you to meet with the office of Student Disability Services, which you can reach at disabilityservices@westminsteru.edu or 801-832-2272. You may wish to start by meeting with Natalie Atkinson, the Accessibility Coordinator. You can reach Natalie at natkinson@westminsteru.edu or

801-832-2608. Her office is in Gore 103.You can find more information, including how to request accommodations, at the *Student Disability Services website*.

Title IX: Westminster University is committed to providing a safe learning environment for all students that is free of all forms of discrimination and sexual harassment. This includes discrimination based on sexual orientation, gender identity and gender expression. If you (or someone you know) has experienced or experiences any of these incidents, know you are not alone. Westminster University has staff members trained to support you in navigating campus life, accessing health and counseling service, providing academic and housing accommodations, and more.

Please be aware all Westminster University faculty members are "mandatory reporters" which means if you tell me about a situation involving sexual harassment or gender discrimination, **I must report that information with the Title IX Coordinator.** Although I have to make the notification, you will control how your case will be handled, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need.

If you wish to speak to someone, you can contact any of the following on-campus resources. These resources are confidential:

- Counseling Center (egibson@westminsteru.edu or 801-832-2237)
- Student Health Services (801-832-2239)
- Victim's Advocate – Stephanie Nolasco (advocate@westminsteru.edu)

If you wish to make a report directly to the Title IX Office, please complete the online reporting form located on the *Title IX website* or contact Mary Edmonds at 801-832-2496 or medmonds@westminsteru.edu. The Title IX website contains more information about resources, rights, policy and procedures, and updated information regarding our Title IX program at Westminster University.

Student Care: Westminster is committed to providing a safe and non-discriminatory environment for all members of the University community, including those whose gender identity and/or expression differs from the sex assigned to them at birth. Harassment and discrimination based on gender identity or expression is prohibited by the University and will not be tolerated. This includes refusal to address an individual by the gender they identify with. If you experience or witness prohibited conduct, or any form of discrimination or harassment, you should contact the Director of Student Care and Conduct listed below.

- Mary Edmonds (801-832-2496) or medmonds@westminsteru.edu

As a professor, just as with Title IX, I am required to report any information I obtain regarding discrimination or harassment to the Equal Opportunity Officer for further review.

Wellness Statement at Westminster University

Westminster University's integrated approach to wellness empowers students to live a healthy life and to develop self-efficacy toward their own wellness coupled with self-efficacy in the communities and social groups with which they are engaged. Through prevention and intervention programs/services students learn how a holistic approach to well-being can help them discover health, contentment, purpose, and connection. Integrated Wellness at Westminster encompasses social, intellectual, emotional, spiritual, physical, environmental, and financial aspects.

Westminster faculty care deeply about both your academic success and personal wellbeing. The University, and its faculty and staff, are all committed to advancing the mental health and wellbeing students, while acknowledging that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression can directly affect students' academic performance. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact the *Counseling Center* at (801) 832-2465 for more information or to schedule an appointment. The *Counseling Center* is located on the lower level of Shaw Student Center.

Resources:

Integrated Wellness Student Resource Guide

SafeUT - connect to a licensed counselor that are ready to help you and listen to any sized crisis or concern. Help is immediate and confidential, and as easy as reaching for your phone and sending that first text.

Purple Basket - The Purple Basket is the basic needs pantry available to anyone within the Westminster community, no questions asked. Students can access a variety of foods, hygiene and baby products, and household items at no cost.

Bias Statement at Westminster University

A bias occurrence involves words and/or actions directed toward a person, group, or property, motivated by a bias against an aspect of one's identity or lived experience, which impacts participation in the campus community. The bias

incident reporting process helps to create an inclusive campus community by providing resources and support to address student issues and concerns that may not rise to a student policy violation. If you believe that you have experienced or witnessed bias in the classroom, residence hall, or at a university-associated event or activity, you are encouraged to report it. To submit a bias incident report, go to the *Bias Report Form*. Bias incident reports may be submitted anonymously.