Title: Physics 4B: Physics for Scientists and Engineers (Calculus – Based) Term: Fall 2016

Welcome to Physics 4B, the second term of a two-semester introductory sequence (4A and 4B) in classical physics. As the course instructor, I look forward to helping you learn the material, do well in the course, and develop a deeper conceptual understanding of the core concepts as well as develop a creative mind that will be useful in the advancement of your future career. My overreaching objective for this course are to help you develop the creative and critical reasoning skills, confidence, knowledge, and technical expertise that will help you become a future leader in your profession. This document is meant to help you make the most of this course. It is divided into three parts: course philosophy, course logistics, and course policies. I look forward to working with you this semester!

Kimal Honour Djam

Contact information	
Kimal Honour Djam; Course Instructor	Lecture Room: Phy 70 Email:kimal.djam@reedleycollege.edu Phone: (559) 638 3641 ext. 3299
Office hours:	Virtual/Remote office hours: Tuesdays: 9:00 AM – 10:00 AM Physical office hours: Thursdays: 2:00 pm to 3:00 pm Fridays : 12:00 pm to 1:00 pm or By appointment
Corequisites:	Completion of MATH 5B – Math Analysis II. Completion of Physics 4A. A solid background in mechanics and in the following math areas is essential: algebra, trigonometry, calculus (differentiation and integration), and vector mathematics. If you take this course without the required prerequisites, you seriously jeopardize your ability to do well. If you are uncertain about your preparation, consult me.
Advisory:	Completion of ENGL 1A Reading and Composition
Class time	Lecture hours: Mondays and Wednesdays 9: 00 am to 10:50 am Laboratory hours: Fridays 9:00 am – 10:50 pm

Course goals

After successful completion of this course, you will be able to…

Apply basic concepts and fundamental laws in thermodynamics, electricity, and magnetism (the "subject area") to:

- analyze the behavior of systems that include conductors, dielectrics, magnetic, electrical, and optical components, such as batteries, generators, motors, electronic components, radios, microscopes, telescopes, optical fibers, etc.
- solve both calculus-based and conceptual problems involving such systems, including problems you have not seen before
- take measurements and analyze and interpret data obtained in laboratory experiments involving such systems

Organize your content knowledge in the subject area by

- articulating the big ideas from each section, chapter, and/or unit
- making connections between different concepts
- recognizing that the various laws/equations are part of a coherent framework of electromagnetic theory
- building on knowledge acquired in previous courses
- synthesizing concepts in the subject area with ideas from other branches of physics, including mechanics, waves, thermodynamics, and relativity
- recognizing the universality of physical laws across subjects, fields, and disciplines

Use multiple representations to solve problems in the subject area, including

- visualizing problems by making simplified sketches that permit you to determine the important aspects of a particular problem
- translating a physical description to a mathematical representation
- interpreting graphical representations of variables and explaining their physical meaning
- explaining the physical meaning of mathematical formulations and solutions

Draw from an array of techniques to solve problems in the subject area by

- choosing, justifying, and then applying problem---solving techniques or procedures that are appropriate to a particular problem (and using these approaches in new contexts — that is, to approach problems you may have not encountered before)
- using a range of skills, including making estimations, approximations, series expansions, recognizing and exploiting spatial symmetries, using calculus, superposition, and vector analysis
- applying conservation principles

Collaborate and communicate clearly, in particular

- justify your thinking by clearly articulating the principles that apply in a given system
- explain your solution method, either written or orally to peers and instructors

In addition to these overarching course goals, there are more specific learning goals for each topical unit in the course. These learning goals will be distributed at the beginning of each unit. The course and learning goals will form the basis for assessment in this course.

Objectives: In the process of completing this course, students will:

- Complete assignments and lab reports outside of class requiring the application of concepts studied in class.
- Use the scientific method for experiments illustrating basic ideas in physics, producing results which must be compared and/or correlated with what has been presented in class lectures.
- Develop new ideas using previously held knowledge as their foundation.
- Use the appropriate language of physics and mathematics in order to solve problems in physics.
- Use problem solving processes developed in this course requiring sound reasoning skills that enhance responsible decision-making.

COURSE EXPECTATION:

What you can expect of me

1. I will work very hard to make this course useful for you (but I cannot do the work and learn the material for you).
2. I will read as much of your reading assignment feedback as possible, respond to some of it before class, and address other parts of it during class.
3. I will closely follow the lecture schedule as outlined in this syllabus. In the event we lag behind or move faster than expected due to unforeseen factors, I will communicate any changes to the class appropriately
4. I will begin and end each class on time.
5. I will be available for assistance throughout the semester. I look forward to meeting you in person.
6. I will do our best to promptly return your phone calls and answer your emails. Please note that a class of the size of Physics 4B can easily generate an overwhelming number of e-mail messages. So, please allow between 24 to 48 hours for all correspondences. Any email received after 6:30 pm will be answered the next business day.
7. I will make sure assignments and examinations are returned to you in a timely manner. In the event of any delays, I will inform the class appropriately.
8. I will make sure the examinations are fair; our grading standards will be fair and open. The grading rubric and standard shall be published and discussed in class.
9. I will listen to and encourage constructive comments concerning my teaching and be open to suggestions and improvement.

What I expect of you

1. You have made a conscious, informed choice to join this class. This means you have read this syllabus, understand the required workload, and meet the prerequisites.
2. You are coming to this class ready to learn, not just to earn a certain grade or meet a requirement.
3. You understand that you have to take an active role in the learning process. You will therefore come to class prepared, having read the assigned course notes for understanding (but not necessarily understanding everything), and provide written feedback on what you need help with.

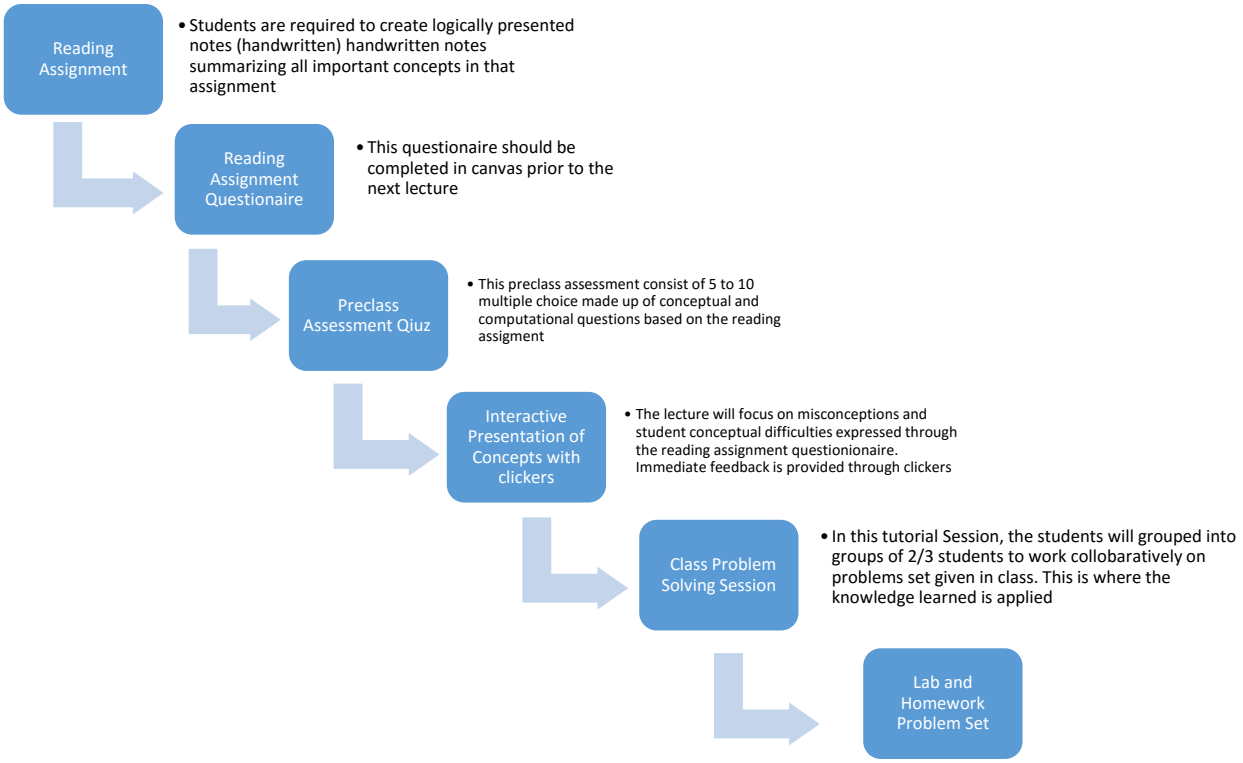
4. You will attend classes regularly, come to class on time and not get up and leave before the end of class.
5. You will participate fully in the classroom discussions.
6. You will aim to communicate your understanding on assignments and examinations. To this end you should always show your work and explain your reasoning
7. You will ask questions if something is unclear — in class, during office hours, by telephone, e-mail or online. Don't wait until the end when there is little time left to address any problems.
8. You understand the benefits of collaboration and the non-competitive nature of this course and are willing to work with others in the classroom, in sections and laboratories, and on your homework assignments.
9. You will bring a positive attitude and share your personality, knowledge and skills with the rest of us throughout the semester.
10. To pass this course, you MUST understand the concepts. Memorization is important but of very little use in this class. You should strive to understand the material presented in every lecture.

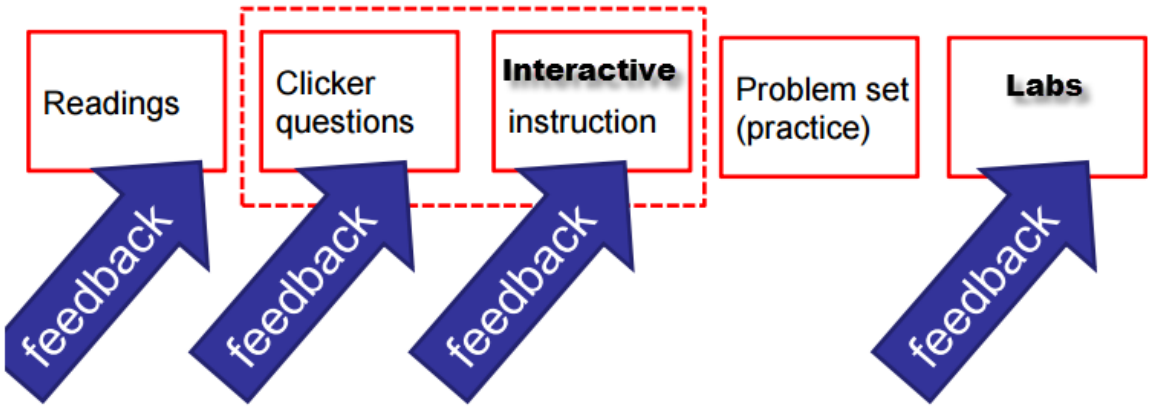
COURSE PHILOSOPHY AND ORGANIZATION

A. Course Structure and Pedagogy

Extensive research has shown that different people learn in different ways. Therefore, this course offers a learning environment with a diversified set of options to ensure everyone have an equal and fair opportunity of excelling in this course. There are class meetings, problem solving sessions, reading assignments, weekly homework, an array of self-assessment options, and many ways to get additional support. The approach adopted in this course has been shown by recent research in physics education to be most effective. I call this the **Integrated Approach to Learning Physics**. Here is the way it works: You will be assigned reading which may be in the form of a video or text prior to each class meeting. By midnight of the day prior to the class meeting, you will complete a brief online questionnaire through canvas. The questionnaire will evaluate your understanding of the reading and what we should cover in class in that topic. (In case of any server failure, just email me your responses.)

During the class meeting (or what we might call the "Interactive Lecture") we will review those areas with which you have indicated that you have had the most difficulty. We will also conduct demonstrations and give you some multiple-choice questions designed to help you with conceptual understanding of the material. Some of the time we may ask you to discuss your answer with students sitting near you and then answer the question again. For each reading assignment, you <u>are required</u> to make handwritten notes summarizing all important concepts in that assignment. This will checked the next lecture and can be used in the Preclass Assessment at the start of the next lecture. At the start of every class, you will be required to answer five to ten multiple choice questions, which will be a mixed of conceptual and computational questions. These questions will both be graded on effort and correctness. Each correct response will be awarded three points while an incorrect response will receive a single point for effort. The diagram below shows the course flow and feedback to you.





Our experience with this approach to teaching is that it changes the dynamic of our class meetings. Students come to class knowing that they need a better understanding of some of the material and are ready to ask questions. Students who have a good grasp of the material gain a deeper understanding than they would have otherwise. Although this technique will put some constraints on your time, I believe that it will allow you to understand the material more effectively, and in the end, reduce the total amount of time that you will need to spend on the course. Learning physics is not simply the acquisition of correct information. Learning requires integrating new information with your own knowledge and experiences; the delivery of

information by itself doesn't help you develop your own understanding of the material. What this means is that we cannot simply 'transmit' knowledge to you — you will have to take an active role in the learning process. The textbook has most of the course material. Presenting all that information again in class would be a poor and ineffective use of your time. If you prepare for class by reading the course notes and letting me know what part you found most difficult, then we can use class time to work together to develop a deeper understanding of the material. Another unsatisfying alternative to building a solid understanding is rote memorization and recall, which invariably leads to boredom and frustration and which has no lasting value. We don't want you to worry about having to "remember" lots of information in this course — you are permitted to use a cheat sheet of one to four pages in all test and examinations.

B. Strategy for success

The Physics 4B is not an easy course. Part of the reason is that the ideas can be quite abstract separate from any technical or mathematical difficulty. In addition, the teaching approach used in this course and my expectations of you are different from those in most science courses. Our goal will be to develop a solid understanding of the underlying concepts — not to simply plug numbers into formulas that may have no underlying meaning to you (and that will probably play little or no role in your future career). For all the reasons mentioned above, advance reading, consistent active participation throughout the term, collaboration, and timely completion of assignments are key to success. If you work regularly and allocate enough time each week to keep up with the course, you will get the most out of the course both intellectually and grade-wise. Pace yourself and give yourself time to learn: The reading will introduce some of the material; class time we will mostly be spent addressing questions you have about the reading. Additional reading, discussions, and homework assignments will further solidify your understanding. If certain points remain unclear, we offer many support resources — we are here to help you. If you follow this prescription you will find that by the time the end of the term comes around, you will have done all the work and mastered the material!

C. Confusion

Confusion is part of learning. You cannot learn new concepts without ever being confused. (You can memorize information without trying to understand how that information fits into the big picture and not experience any confusion, but that doesn't constitute learning.) At the same time, the feeling of being confused can be very disconcerting, especially when you are under pressure to perform. In lecture, we will challenge you to think and build your own understanding of the material. We will elicit confusion; then help you resolve that confusion. By learning to master confusion, you will build confidence. So, if you feel unsure about something or don't understand a new concept right away don't panic: remind yourself it takes time to fully understand new material. Even after teaching introductory physics for many years, I occasionally get confused myself, as well as continue to deepen our own understanding of the material by answering your questions. Think of confusion as an opportunity to learn, not as a failure or an obstacle to understanding. Most importantly, simply trying to 'remember' something that confuses you or that goes against your 'gut feeling' makes no sense: if you feel unsure about something and you have given yourself some time to try to understand on your own, seek help by discussing it with others or with the staff.

D. Counterproductive practices

Two strategies that generally don't pay off are memorization (a cheat sheet of up to 10 pages front and back) is permitted in all examinations anyway) and cramming to catch up just before the examinations (it will be impossible to assimilate all the material). Compulsively solving countless problems in hopes of learning by example is not very effective either: this approach is very time-consuming (and awfully boring) and prevents you from putting the effort into understanding the underlying concepts.

COURSE LOGISTICS

A. Course Materials

Your main source of information for this course will be a set of course notes from MIT and Harvard which can be downloaded from the following website free of charge and from the course textbook. The notes will posted on our course webpage in canvas.

1. http://web.mit.edu/8.02t/www/coursedocs/current/guide.htm?SEC=L01
2. https://scripts.mit.edu/~srayyan/PERwiki/index.php?title=Main_Page
3. http://www.colorado.edu/physics/phys1120/phys1120_sp16/LectureNotes1110/lectureIndex.html

Course Textbook: "Physics for Scientist and Engineers with Modern Physics", Giancoli, 4th Edition, Pearson/Prentice Hall Publisher. Additional handouts will be made available via the course Web site.

B. PRS: Clickers

To respond to the conceptual questions ("Conceptual reasoning task") asked in class, you will need a "clicker" or other compatible device. I will provide a PRS to all students. The purpose of this classroom response system is to engage you in the material, give you a chance to learn from (and teach) your classmates, and provide me with direct feedback on areas you are having difficulty understanding. Often I will completely change the lecture based on your responses.

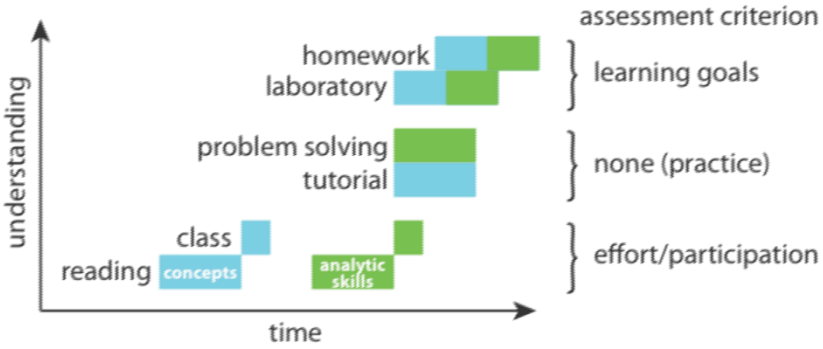
C. Reading assignments

Each class meeting is preceded by a reading assignment, which is due by midnight the day before coming to class. A schedule of these assignments is attached at the end of this syllabus. Because the class meetings are not standard "lectures" — that is to say, they are not simply a presentation of the material printed in the course notes — **these reading assignments are very important**. To complete each assignment, you must read some sections from the course notes (one chapter). Late submissions are not accepted.

What to expect: Reading the assigned course sections or notes for understanding is a very important part of the work you will be doing. More importantly, pre-class reading provides experience in an area that you are likely to encounter often in your future career — reading scientific text for understanding. Typically, you should set aside 2-3 hours to complete each reading assignment. Even though we do not expect you to fully understand everything before coming to class, you will often have to read some passages several times to build your understanding. The goal of the reading assignments is to prepare for class, to familiarize yourself with new terminology and definitions, and to determine which part of the subject needs more attention (you'll convey that to me in the online part of the assignment). Just skimming the text or quickly read the text one time through won't enable you to answer the pre - class questions in a satisfactory manner

and earn credit for your work. These questions are graded on a three -point scale and points accumulated on these assignments are worth 10% of the final grade.

D. Lectures



Each class will contain three parts namely:

Part 1: Preclass Reading Conceptual Reasoning Test

The first will be a pre-class clicker test immediately followed by an interactive discussion of the feedback obtained from the reading assignments. This is to convince the teacher that you have read the text for understanding and are beginning to synthesize the information in a coherent manner and to give you a flavor for what you should hope to learn and understand from the next section.

What to expect: This session consists of five to ten multiple choice question aim for you to demonstrate you have intentionally completed the reading assignment. You will cannot collaborate nor discuss with your peers on this session but you can refer to your handwritten summary notes only. Each correct response is three points while each incorrect response is one point. This section constitutes 15 percent of the final grade.

Part 2: Interactive Presentation

The second part is a short interactive presentation ("lecture") by the instructor on key ideas on the reading, as well as some interesting extensions into the modern world when appropriate. This presentation is interspersed by conceptual reasoning task. These are short multiple-choice questions that focus student common misconceptions in the topic. You will be able to answer these questions using a clicker (see above). Your answers on the conceptual reasoning task are not graded for correctness but to earn full credit, you MUST participate in more that 95 percent of the clicker questions posed in class. Regular and consistent participation in the conceptual reasoning task during lectures can increase the weight of your final exam (see the rubric below). This will count towards class participation grade. The following rubric will be used to give extra credit points towards your final exam grades based on your classroom participation:

10 points added to Final Exam grades	above 90 percent correct most of the time on clicker questions during lectures
7 points added to Final Exam grades	Above 80 percent but less than 90 percent correct on clicker questions during lectures
5 points added to Final Exam grades	Above 70 percent but less than 80 percent correct on clickers questions during lectures

0 points added to Final Exam grade	Less than 70 percent

What to expect: The short interactive presentation part will not aim to cover all the material in the reading (nor all the material you are expected to learn), but will aim to highlight key insights, connections, modern applications, etc. The conceptual reasoning task are meant to challenge you. They provide a form of continuous self- assessment and give important feedback to the instructors. The ensuing discussions will often help clarify conceptual difficulties. To be effective these questions must be challenging enough to stimulate discussion, so the answer too many of the questions may seem counterintuitive and perhaps even confusing at first. The goal is to build intuition and overcome confusion. Analysis of past years' data shows that on average people get about 50% of the questions correct before discussion; even the top students select incorrect answers on 25% of the questions. After discussion, the percentage of correct responses (and the corresponding understanding of the material) goes up significantly. Students who participate consistently in the discussions tend to obtain significantly higher grades in the class. If you find you do not benefit from the discussions of the questions, consider switching discussion partners. Since you might miss the class occasionally (illness, varsity sports, debating tournaments, etc.), in the event you miss class, contact the teach immediately by email ONLY. Failure to contact the teacher prior to missing class by email will forfeit your right to earn any points.

Part 3: Group Problem Solving

The third part is a group problem solving session. This provides an opportunity for you to solidify your understanding of the concepts as well as collaborate with your peers. This problem solving sections focus on common misunderstandings and then resolve those in a group discussion. The role of the Instructor is to facilitate discussion and to make sure that your worksheet contains the correct information at the end of the section. During the third part of section, you (and your group) can get started on the homework assignment. You should form a group of people with whom you can meet regularly to work together and address difficulties. If you find that you do not benefit from working with your group, join (or form) a different group. It is of utmost importance that you find the right people to work with throughout the semester. For the homework, you can work with this same group, work with a different group, or work alone.

What to expect: Like the Conceptual Reasoning Task, the sections focus on common misunderstandings and then resolve those in a group discussion. My role as your teacher is to facilitate discussion and to make sure that your worksheet contains the correct information at the end of the section. During the second part of section, you (and your group) can get started on the homework assignment. You should form a group of people with whom you can meet regularly to work together and address difficulties.

Labs

The purpose of the labs is to give you an opportunity to experimentally explore some of the main concepts covered in the lecture. You will complete approximately two laboratory experiments per week. These experiments include aspects of measurement and uncertainty, force and motion, Conservation of momentum, impulse, work and conservation of energy. Working in groups, you will develop experimental and collaborative skills. There will be both short, directed lab activities as well as a few longer investigations that involve skills of inquiry, experimental design and presentation. In general, the aims of lab work include the following:

- To support the development of conceptual understanding
- To provide experience in investigation and inquiry
- To support the development of analytical skills of experimentation, including data analysis, error analysis, modeling, estimation, and ethics
- To provide familiarity with experimental equipment, including software interfaces
- To support the development of presentation skills, including use of data presentation software

What to Expect: Students will work together in groups of three when possible (two students at a minimum). All data, graphs, answers to questions, and conclusions are a collaborative effort within the group. Actively working together is an important requirement for succeeding in the course. Each group member is assigned the same grade for the submitted work (see lab grading procedure below). Students must arrive on time for their lab; you will not be allowed to participate in your group if you are late. Student must attend each of their lab sections. If you miss a lab without an excused absence you will receive a zero for the experiment. At the end of each lab each group will hand in a lab report to receive credit for the lab. The report should be signed and dated by all participating members prior to submission. Your lab report must contain a short description of the experiments you performed, the results you obtained, the conclusions you draw from those results, and address any questions posed in the lab handout (a few pages all together).

Lab Grading Procedure

Each lab experiment is graded as a group on a scale of 0-5. The grading is based on the following rubric.

5	The group clearly understands the major lab concepts. Minor mistakes and careless errors can appear insofar as they do not indicate a conceptual misunderstanding. The lab is very neat and well organized.
4	The group understands the main concepts and problem-solving techniques, but has some minor yet non-trivial gaps in their reasoning. The lab lacks a little in neatness and organization.
3	The group has partially understood the problem. The group may have started out correctly, but gone on a tangent. Some aspects of the lab are incomplete. The lab is disorganized or hard to read/follow.
2	The group has a poor understanding of the lab. They may have gone in a not-entirely- wrong but unproductive direction, or attempted to solve the problem using pattern matching or by rote.
1	The group did not understand the problem. They may have written some appropriate formulas or diagrams, but nothing further. Or, they may have done something entirely wrong.
0	The group wrote nothing or almost nothing. **Note:** Individual students will receive a zero for a lab experiment if they do not actively participate in their group or they miss the lab without an excused absence.

Missed Labs, and Cancellations

Labs can only be made up with a doctor's note or documented emergency. The course instructors must be notified by email as soon as the conflict arises, preferably before your lab section is scheduled to meet. You must have written (email) approval from the course instructor with a specific time and date for a make-up before attending a lab other than your assigned section. All appeals to make up a lab are at the discretion of the course instructor. Labs may be rescheduled due to cancelations caused by inclement weather or other emergencies.

Homework

Weekly homework consists of a set of challenging conceptual and quantitative problems. The homework assignments will be made available about one week before their due date (usually posted on the website on Friday and due the following Friday). Solutions will be posted shortly after the due date.

- Your work should be neat and orderly; make large, understandable, and clearly labeled diagrams for every problem. Formulas and numbers alone won't do; you must show your work and explain your reasoning to earn full credit on a problem.
- You are required to show your work and reasoning as appropriate to receive full credit. A model solution will be posted in week one. What constitutes good solutions will be an ongoing topic of discussion
- You are welcome and encouraged to work on homework with your classmates. Please feel free to seek help from instructors, tutors, or resources on campus. The work you turn in must be your own.
- Hand in your work on 8.5 × 11" sheets, stapled together, with your problems in numerical order as assigned.
- On the top left corner, put your name, the names of people you collaborated with, the assignment number, and your section number.
- Complete solutions will be available soon after the due date. These solutions will be useful in giving feedback; please use it for this purpose. As you use these solutions, however, you will find that you may occasionally need to do a little thinking about how one step follows from the next, and you will encounter the fact that there are often many different good ways to solve a problem. Your aim in using these solutions is not to memorize them for use on similar problems, but to gain a sense of the representations and principles that will enable you to solve problems you haven't seen before.

What to expect: The homework is submitted in two parts: the first is submitted online. This checks for correctness only. The second part is submitted in class. This is a paper copy and verifies the procedure and each problem will be graded on a 0 – 5-point scale. Graded homework is returned during section. Please keep your graded homework as proof of completion of work. The homework assignments are worth 5% of the final grade.

Examinations

There will be two midterms and one final exam. Exams will cover the broad range of subject matter and course learning activities.

1. All exams are open book, but generally useful equations and physical constants will be provided upon request. You are allowed to use a cheat sheet of up to 10 pages front and back. You will be provided a formula sheet. This is to eliminate rote memorization, stress, and anxiety and cram work leading up to the examination and promote understanding.
2. For full credit in all examinations, you must show all steps leading up to an answer, draw appropriate diagrams, simplify all answers and work necessary to demonstrate the result.
3. The exams are not "open internet" however. Using the internet during exams is not allowed.
4. All examinations are two – staged exams. In the first stage, students start by taking a normal, individual exam. This first individual portion of the test holds students accountable for their studying and preparation and constitute 85 percent of the exam. The second stage is a group stage. Students form ad-hoc groups of 3 and re-do the identical exam in the first stage. This constitute 15 percent of the exam. Your group must reach consensus to submit each answer. Each student's grade will be a combination of their individual and group exam scores. This exam structure has been developed and tested at other institutions and student response has been extremely favorable. It reduces some of the stress of the exam and also makes the exam into more of a learning experience.

What to expect: The questions on the exams are a combination of quantitative problems and conceptual questions resembling the Conceptual reasoning task and the type of questions on the weekly problem worksheets as well as the problems in the tutorial worksheet. The examinations cover all the material in the course notes that has been assigned as reading (even if the subject was never discussed in class or in section or included in a previous assignment).

Time commitment

Physics 4A, B are demanding courses and you will need to allocate sufficient time during the semester to do well in the course. This is a six weeks' summer course and demands a lot of your time per week. You should count on spending anywhere between 24 and 26 hours per week for all activities, more if you need to catch up a bit. If you do not have this time available, you should seriously reconsider taking this course. In a typical week, you will need the following time allocation:

Reading/Studying	5.3 hrs/week
Lectures	3.7 hrs/week
Homework	2-3 hrs/week
Laboratories	1.5 hrs/week
Total	➢ **13 hrs/week**

During weeks where in-class examinations are given there will be no homework. The time normally allocated to these activities can then be devoted to study for the examination. Provided you have kept up with the material, it should not be necessary to spend any more time to prepare yourself. If you find you are spending significantly more time than 15 hours per week, you should contact someone on the student success center or myself to help you develop a different study strategy.

COURSE POLICIES

Collaboration

We encourage collaboration in class, during sections and labs, and on homework. Because the course is graded on an absolute scale, you will never reduce your grade by helping others — on the contrary, by doing so you will reinforce your own knowledge and improve your performance. Before working together or consulting others on any assignments, however, it pays to give yourself an opportunity to work on it alone. When handing in work on which you worked together with others, you must always 1) state the names of the people you collaborated with and 2) submit individual and original solutions. When you sit down to write up your answers for submission, you should do this without consulting notes copied from someone else. **Work that closely matches someone else's is unacceptable**. Activities for which collaboration is not permitted are: reading assignments, in-class pretests, Web-based tests, and individual examinations.

GUIDELINES FOR COLLABORATION

Please follow these guidelines and policies regarding acceptable collaboration between groups of students in physics 4A.

- It is ok to discuss the general approach to solving a problem.
- You can work jointly to come up with the overall approach or general steps for a solution.
- It is ok to get a hint, or several hints for that matter, if you get stuck while solving a problem.
- It is ok to have someone show you a few steps of a solution where you have been stuck for a while, provided of course, you have attempted to solve it yourself without success.
- You should work out the details of the solution yourself.
- It is not ok to take someone else's solution and simply copy the answers from their solution into your checkboxes.
- It is not ok to take someone else's formula and plug in your own numbers to get the answer.
- After you have collaborated with others in generating a correct solution, a good test to see if you were engaged in acceptable collaboration is to make sure that you are able to do the problem on your own.

Grading standards

The final grade is calculated on a weighted scale as follows:

Reading Assignment and Preclass Concept Assessment	Interactive Class Problem solving and PRS participation	Weekly Problem Set and Quizzes	Midterm Examinations	Final Examination	Laboratory
15 percent	5 percent	5 percent	30 percent	30 percent	15 percent

Reading Assignments & Assessment, Class Participation, Weekly Problem Set, and Laboratories add up to 40% of the final grade. The in-class examinations allow you to further reduce the weight of the final to as little as 30% of the final grade. You can therefore assure yourself of a good grade by working consistently throughout the term.

Percent Grade for the Class	Letter Grade	Criteria
89 % - 100 %	A	A : excellent performance B : good performance C : satisfactory performance D : less than satisfactory performance F : unsatisfactory performance
78 % - 88 %	B	
60 % - 77 %	C	
50 % - 59 %	D	
< 50 percent	F	

The final grade is calculated on an absolute scale and is based on a point total of 100 of which 5 points are for the Week Problem Set, 15 points for the reading assignments & assessments, 15 points for the laboratories, 5 points for class participation & group problem solving and 60 points for the examinations. Bonus point's worth up to 10 points can be accumulated from the pretests and classroom prs questions. These points are weighted by your classroom participation and reduce the weight of the final exam. The lowest in---class examination score is not counted; the remaining two count for 15 points each. The final examination allows you to gain back points not realized on the in-class examinations: it is worth 60 points, minus the two highest scores for the in-class examinations, minus any bonus points. A worksheet with letter grade cut-offs will be handed out early in the c o u r s e .

Please keep in mind that simply keeping on top of the work lets you accumulate a considerable number of points. Class participation, reading assignments, tutorial pretests, problem sets, and laboratories add up to 40% of the final grade. The in-class examinations allow you to further reduce the weight of the final to as little as 25% of the final grade. You can therefore assure yourself of a good grade by working consistently throughout the term. Finally, the scores of your in-class examinations can be made up on the final exam.

Regrades

Requests for correction of grading mistakes on exams must be made within a week of issuance of the assigned grade and you **must not** have added anything to the original writing on the assignments. (Please note that we keep all examinations and some of the homework.). Any cancellations, signs of alteration will disqualify any regrades opportunity. We never reevaluate credit for a single problem: a regrade request of a single problem triggers a regrading of the entire assignment or examination and grades can move up or down. Only if the grade changes by 5% or more of the maximum point total for each examination (10% on homework assignments) will the new grade replace the old one.

Missed or late assignments and examinations

In case of extenuating circumstances, such as religious holidays, illness, injury or other personal emergency, you can request an extension for assignments. Sports or other extracurricular events are not treated as extenuating circumstances. Any such requests must be made before the due date; requests made after the due date will not be considered. You can get half credit for up to one late homework assignment without prior extension, provided you hand in your work in person to the instructor within one week of the due date. Your submission must still be original — copies (handwritten or otherwise) of solutions are not acceptable. At the end of the term we will offer an opportunity to make up a missed laboratory assignment. There are no make-up in-class examinations; if you miss an in-class examination for an officially excused reason (religious holiday, documented illness or family emergency, or official university business) we will

replace your missed examination score with the appropriately scaled score on the portion of the final exam that covers same the material as the missed in-class examination. Make-up final examinations are granted and administered by the Registrar's Office.

Academic dishonesty

Students registered in this class are assumed to be giving their word to the college that they will not cheat. Therefore, all students proven guilty of academic dishonesty in this class will receive an F/N grade with the recommendation that they be suspended. (In other words, don't waste time thinking about cheating.)

Do not cheat. A score of zero will be give on any assignment/test where cheating is involved. Any cheating will also result in a referral to college administration. For this class cheating means: (1) providing to other students answers or partial answers to quiz and exam questions or labs, (2) obtaining from other students answers or partial answers to quiz and exam questions or labs, and (3) obtaining information or direct answers from unauthorized materials during quizzes and exams or labs. Students who need help in understanding quiz and exam questions should consult with me to avoid the appearance of cheating. Please note that you are encouraged to work with your fellow students on homework assignments and you may use any materials you need to do the homework. The key to physics is not "knowing formulas", but understand how to properly apply your mathematical tools to physical problems. In light of this fact, the instructor may allow you to bring in your notes into tests, and if not, a formula sheet will be provided. I also reserve the right to have "closed calculator" quizzes and exams. A calculator is the only electronic device you may use on a quiz or exam. If I believe that a student is cheating, even if I cannot prove it, I will retract any letters of recommendation for the student, explaining to the party in question why I am retracting my support.

Dropping:

It is the student's responsibility to drop if they no longer want to take the class. I will not drop a student for non-attendance, nor will I use an "instructor's drop" if a student has missed a deadline.

Disability Statement:

Any student who feels he or she may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. I will work with the Disability Resource Center to coordinate reasonable accommodations for students with documented disabilities. For best results this should be addressed as soon as possible.

Class Climate:

Student Rights and Responsibilities: Students have both rights and responsibilities. You have the right to be taught by a qualified teacher, graded fairly and expeditiously, and provided with a respectful, stimulating learning environment. Students also have a role in creating and maintaining a respectful, stimulating learning environment. You should participate in a thoughtful manner by sharing your ideas and responding to the ideas of others. When another person in the class is speaking, you should give that person your full attention. You should treat everyone in the classroom with respect; belittling or derogatory remarks are not appropriate. Really thriving in this class involves openly sharing your current understandings, which are often in need of improvement (Otherwise, why are you in the class?). Not only is there much to learn from the free expression of each other's mistakes and misconceptions, you will not learn as well if you feel intimidated from expressing yourself for fear that you will be belittled or dismissed.

Since you are here to learn, you are responsible for completing assigned readings and work on time, as well as showing up for class in a prepared manner. You have a responsibility not only to yourself, but to other students who will be distracted when you are not engaged in learning or who rely on you for group activities. Cell-phones/ pagers are to be turned off during class (and no text messaging) unless there is a reason that you have cleared with the instructor. You should be attentive and focused on the work at hand; you are not allowed to do work for other classes or use class computers or your own laptop for activities outside the class during class time. You will have timely ten-minute breaks approximately each hour to conduct personal business or work involving other classes.

If you have questions, or you are unclear about elements of the subject matter, it is part of your responsibility to ask questions. If part of the class is not working well for you, you have the responsibility to share this fact with the instructor.

Academic dishonesty is inappropriate in the class and college environment. If it appears to the instructor that your behavior is similar to that of students who have engaged in academic dishonesty, the instructor will take action that will reach a determination of whether academic dishonesty took place. You have the right to due process in this determination. In general, the instructor does not make the determination of whether academic dishonesty took place, because part of the optimum learning environment is a practice of trust by the instructor.

Professor Rights and Responsibilities: Instructors have the right to be treated as professionals and to create, structure and teach classes in the manner that their expertise and training best informs them. Instructors for this class don't see the class as either teacher-centered or student-centered, but as subject-centered. That is, the subject matter, and what is needed to best learn it, will direct the roles of both the students and the instructor. That is what instructors will keep in mind as they exercise their responsibility to structure the environment in which you learn. For example, you may wonder whether it is appropriate to ask a particular question. Your main job is to ask the questions you need to ask. You should not hold back because you think it might interrupt the class. It is your instructor's responsibility, and not yours, to determine whether there is sufficient time to answer questions or whether the questions are sufficiently distracting to other students. Each of you are also encouraged to use multiple avenues to keep your instructor informed about what is working (or not) to support your learning in this class.

The classroom is a sacred space, and it is the instructor's responsibility to define appropriate rules for the class and to protect the boundaries of the class. In accordance with Lane policies, an instructor may dismiss a student from a class for the day for in-class behavior that is deemed to be disruptive or inappropriate. All guests (or other non-students) may attend only with the consent of the instructor, and may attend only under the conditions set by the instructor. For example, adult guests are usually expected to participate in class activities.

I welcome the responsibility to encourage you to use college procedures to improve the course and your learning environment. I invite you to inform me of problems you have with the course, make suggestions for improving the class or your learning, and make suggestions for maintaining the quality of the class and your learning. I encouraged you to find out about the student complaint procedure or other resources for redressing grievances, which you may do by asking me or consulting the college catalogue.