

This is a sample syllabus for PHY2053C. Students should reference the section syllabus provided at the beginning of the semester for specifics regarding assignments and grade assignments.

PHY2053C – COLLEGE PHYSICS A

Instructor:
Email:
Office:

Phone:
Office Hours:

Teaching Assistant:
Email:

Prerequisites: MAC 1114 (Trigonometry) and MAC 1140 (Algebra) with grades of “C–” or better.

COURSE DESCRIPTION

This course is the first semester of a two-semester sequence for life-sciences students and is intended to provide a general knowledge of the basic concepts of physics relating to mechanics, energy, gravity, rotational motion, fluids, heat, thermodynamics, vibrations and waves. Physics is based on problem solving and this class involves both solving word problems and performing laboratory exercises. The level of mathematical skill necessary to complete this course is a strong proficiency with algebra (especially word problems) and trigonometric functions; calculus is not used.

COURSE OBJECTIVES

By the end of the course, students will demonstrate the ability to:

- solve one- and two-dimensional kinematics problems
- use Newton’s Laws to describe simple physical situations
- apply the principles of conservation of energy and momentum
- solve problems involving circular motion, springs, and gravity
- apply the ideas of energy and heat transfer to simple systems

According to the Liberal Studies for the 21st Century, students will demonstrate the ability to:

- think critically and cogently about causal relationships with scientific reasoning.
- assess previous experimentation and published scientific results.
- critically examine and evaluate scientific observation, hypothesis or model construction.
- articulate a variety of issues created by the complex interactions among science, technology, and society.
- use scientific perspectives to evaluate contemporary problems facing society.
- explain the process of scientific reasoning and apply scientific principles inside and outside of the laboratory or field setting.

- systematically evaluate evidence for accuracy, limitations, and relevance, and identify alternative interpretations of evidence.
- design and conduct experiments to make observations and test hypotheses, as well as to analyze and interpret data using quantitative and appropriate technological tools.

COURSE MATERIALS

TEXTBOOK

Nicholas J. Giordano, *College Physics: Reasoning and Relationships*, 2nd edition (Brooks/Cole Cengage Learning, 2013) ISBN 0-534-42471-6 (hardcover, both semesters), or ISBN 0-534-46244-8 (thinner hardcover, covers this term only). You can also use the older 1st edition of the same textbook.

iCLICKER

This course also requires the use of an i>clicker which may be purchased at the FSU bookstore, at Bill's bookstore, or online.

CLASS MEETINGS

Each student must be registered for four class meetings per week.

- **Two lectures each week**
- **One recitation session each week**
- **One laboratory session each week**

Notice that the registration process for this class requires that every student must be registered separately for both a lecture/recitation section *and* a lab section to be properly registered for this course.

LECTURES

The lectures will primarily be used to present new course concepts, along with experimental demonstrations and discussion of problem solving tools and examples. Lecture highlights will be posted on the course web page. These highlights will indicate the exact topic areas covered during lecture and which textbook sections they were drawn from. However, these highlights **do not** contain all the information and explanations that will be presented during the lectures. Therefore, students are strongly encouraged and expected to attend and participate in the lectures. Also, it is a demonstrated fact that lecture attendance improves student performance. If you don't know what we are emphasizing in class, you won't do well on the tests. In-class participation will be recorded primarily using the **i>clicker** personal response system, and during each lecture, 2 to 4 questions will usually be presented where you will be expected to answer the questions via **i>clicker**, and the results will be included in your 'in-class participation' grade.

RECITATIONS AND MINI-EXAMS

The lectures are supplemented with a 75-minute “recitation style” session, during which the focus will primarily be on working through problem solving techniques (either from the homework set, the textbook, or other problems). The discussion of problems is not only to give you the answers to individual problems and questions, but also to show you the methods of *problem solving* itself, which is far more valuable. You will be expected to attend and participate in these discussions. The mini-exams, a major part of your course grade (45%), will be given during recitations.

LABORATORY EXPERIMENTS AND PRE-LABS

The purpose of the laboratory sessions is to gain hands-on experience with laboratory apparatus, to develop skills in performing experiments, to learn methods for analyzing scientific data, and to relate the physics concepts covered in lectures with real experimental situations. During the lab sessions, each student must complete and turn in a lab report, following the format prescribed by the lab instructor, before leaving the lab session that day. Lab manuals can be downloaded from the lonCAPA homework system, which also contains the Prelab problem sets, which also contribute to your grades. Attendance at each lab session is a requirement of the course. The grades on the lab reports and prelabs combine to account for 13% of the total course grade.

STUDENT RESPONSIBILITIES

COURSE PHILOSOPHY

This course is not a pushover. Physics is based on understanding, not just memorizing. This is especially true with the problem solving techniques that we emphasize in this course, because problem solving is a thought process that requires new ways of thinking. We will do all we can to help you, but you must take personal responsibility to put some **serious effort at understanding underlying concepts** and how they are applied. Below is what is expected of you:

CLASS PARTICIPATION

Attend all lectures including recitations; what you retain from these classes will surprise you. Students are expected to arrive on time and remain in class for the entire class period. Class participation will be part of your final grade (3%). The class participation points are earned by answering questions using the i>clicker. Each student is responsible for bringing his or her own functioning i>clicker (registered at <http://www.iclicker.com/support/registeryourclicker/>) to class every day, and using it to answer the requested problems. You cannot earn the points without it.

Note: It will not be possible to make any corrections or adjustments to the i>clicker scores for any reason (such as forgetting to bring it to class, dead batteries, absences, incorrect registration). It is a violation of the University Honor Code to use any i>clicker other than the one registered to you in the class.

HOMEWORK

Success in this course depends to a large extent on the effort you put into completing the weekly homework assignments. The homework is a significant component of the final grade, and is the best way to prepare for the exams. Homework sets are found online on lonCAPA and can be accessed either through BlackBoard, through loncapa.fsu.edu/, or by going through the open course website in the Physics Department at www.physics.fsu.edu (go to Undergraduate, and the physics courses web pages, and find our class and its links). Log in using your FSUID (Blackboard login) and password.

Completing the online problem sets and working through textbook and other problems are the best ways to prepare for the mini-exams and the final exam. It is important that you learn the concepts, not just which formula to plug your numbers into. Among other things, understanding the underlying concepts will help you know which equations to use, what times one equation is valid and not another, and how the equations can be applied to different situations. There are two homework sets each week:

- Pre-lecture “Reading Warm-up Problems”: a few simple problems that should easily be done after a brief, but complete, read-through of the chapter, **due 30 minutes before your lecture class meets the first day that we meet each week**. These will be available approximately two days before they are due.
- The main “Homework Set”: a much more detailed, comprehensive set of problems each week, which are **due precisely at 11:59 pm every ___ night**. These problems given to correspond roughly to when we are finishing the discussion of each chapter, are ~20 problems, and are available ~10 days before they are due.

LABORATORY REPORTS

Each student should attend laboratory sessions at the registered time and classroom. Actively participate in the experiments and complete an individual lab reports for each lab, following the format prescribed by the laboratory instructor, *before* leaving the lab session. Attendance at each lab session is a requirement of the course.

The Pendulum Lab is used to assess the the Liberal Studies Natural Science Competencies. If you do not complete the Pendulum Lab, your overall course grade will be reduced by one full letter grade.

CURRENT EVENTS WRITING ASSIGNMENT

This assignment is used to assess the Liberal Studies Natural Science Competencies. It is worth 3% of your course grade. If you do not complete the assignment, your overall course grade will be reduced by one full letter grade. Late assignments will be accepted at the sole discretion of the instructor.

Select a current news item related to one or more of your assigned week's topics in class (see the syllabus) and describe the relationship between the news item and physics. How does what you've learned in class help you interpret the news item? How does your general knowledge of scientific reasoning and principles help you interpret the news

item? What additional information would you like to have about the news item to improve your understanding of it?

Provide a reference for the news item (such as a URL). Your response should be about 250 words in length and turned in via _____. If your response is found to be plagiarized, you will receive no credit, fail the course, and be reported for an Honor Policy violation.

Due dates are based on the first letter of your last name. All responses are due by 11:59 p.m. on the Sunday night following your assigned week.

Week 2	A, B
Week 3	C, D
Week 4	E, F
Week 5	G, H, I
Week 6	J, K, L
Week 7	Mid-term exam
Week 8	M, N
Week 9	O, P, Q
Week 10	R, S
Week 11	T, U, V
Week 12	W, X, Y, Z

The grading rubric is:

Selection and reference of an appropriate article	2 points
Overall clarity of response	2 points
Description of relationship	2 points
Interpretation/scientific reasoning/additional information	4 points

‘BIWEEKLY’ MINI-EXAMS

Seven quizzes will be given during the semester. Preparing for these bi-weekly quizzes has the most important impact on your final grade, since they account for 45% of the final course grade. Below are a few rules and common questions about the exams:

- Seven mini-exams will be given during the semester. The **best scores** for **six** of the seven mini-exams will count toward your final grade, with the lowest score being dropped. Thus each exam contributes 7.5% towards your overall course grade.
- These mini-exams will be given on the designated day (see schedule below) and each will take the 50 minutes, at the beginning of recitation class.
- The material covered in each mini-exam will be that specified in the syllabus and based on concepts related to the recent homework assignments and recommended textbook questions and problems.
- **No make-up exams will be given.** Students who cannot attend one of the seven mini-exams for *any* reason—medical reasons, death in the family, etc.—will have that miss count toward the low dropped score; and any further misses will be counted as a zero for that test. No exceptions to this rule will be given except for special university mandated reasons, and must be discussed with and approved by

your lecture instructor in advance. (A word to the wise: proper documentation will be required for any misses.)

- Students arriving late to the test will be required to submit their exams by the same deadline as the rest of the class.
- Each student is responsible for bringing a working calculator to each exam. No sharing is allowed. You will **not** be allowed to use your cell-phone/smart-phone/ipad, etc. as a calculator.
- Do not program any solutions into your calculator—this is cheating and will be treated as such.
- Don't cheat. The first instance of cheating results in a grade of zero for that assignment or exam, the second results in an "F" for the course. Cheating includes getting aid in doing your work from any outside person or source, or in assisting someone else in gaining an unfair advantage on their work. Remember the FSU Honor Code.
- Any questions you have with the grading of any of the exams must be resolved within 2 weeks of the hand-back date for that exam. Regrades will not be considered except in the case of gross negligence or error by the grader.

FINAL EXAMINATION

Every student is required to attempt the final exam. (See the Block Exam Schedule in the FSU Directory of Classes.) The final exam is cumulative and an equation sheet with all the necessary equations and constants will be provided. The Final Exam will generally NOT be held in our normal classroom; the place for the exam will be announced later in the semester.

GRADING

GRADE PERCENTAGES

Online Homework	19%
regular lonCAPA homework sets	15%
pre-lecture reading warm-up lonCAPA problems	4%
Lab Reports	13%
in-class Laboratory Reports	10%
on-line PreLab lonCAPA problems	3%
Current Events Writing Assignment	3%
Mini-Exams	45%
Final Examination	20%

BONUS POINTS

Students can earn up to three extra percentage points (3%) added to his/her final accumulated score through class participation, and by answering questions using the i>clicker personal response system during the lectures.

FINAL GRADES

A student will have completed the course and will be eligible for a grade better than an "F" only if the student does the following:

- attempts the final exam; and

- attends all laboratory sessions and submits satisfactory reports to the lab instructor for each session.

Further, students must complete the two *Liberal Studies in the 21st Century* requirements:

- the Current Events Writing Assignment
- the Pendulum Lab.

Not completing one of the liberal studies requirements will result in your overall course grade being reduced by one letter grade. Not completing both of the requirements will result in your overall course grade being reduced by two letter grades.

The course grade will be assigned using the table below.

A	100-91.0	C+	<74.4-71.0
A-	<90.9-87.50	C	<70.9-65.0
B+	<87.4-84.0	C-	<64.9-61.0
B	<83.9-78.0	D	<60.9-55.0
B-	<77.9-74.5	F	<55.0

COURSE SCHEDULE

For a detailed schedule with links to detailed class notes in .pdf format, please see the course website: <http://www.physics.fsu.edu/courses/Fall14/PHY2053C/default.htm>.

Week	Topics to be Covered
1	Introduction Ch. 1: Scientific Notation and Units; Problem Solving Techniques; Ch. 2: Dimensional Motion and Forces
2	Ch. 3: Kinematics in One Dimension
3	Ch. 4: Kinematics in two dimensions Ch. 2: Forces & Newton's Laws
4	Ch. 2-4: Forces in two and three Dimensions Ch. 5: Circular Motion & Gravity
5	Ch. 5: Gravity and Orbits Ch. 6: Work & Energy; Conservation Laws
6	Ch. 6: Conservation of Energy Ch. 7: Linear Momentum and Collisions
7	Ch. 7: Elastic & Inelastic Collisions Ch. 8: Rotational Motion and Equilibrium
8	Ch. 8: Rotational Motion Ch. 9: Energy and Momentum of Rotational Motion
9	Ch. 9: Angular Momentum and Rotational Energy Ch. 10: Fluids – Statics (Archimedes, Pascal)
10	Ch. 10: Fluids – Dynamics (Bernouli) Ch. 11: Harmonic Motion
11	Ch. 11: Harmonic Motion Ch. 12: Waves, Standing Waves, Harmonics

Week	Topics to be Covered
12	Ch. 12/13: Waves and Sound Ch. 13: Sound: Harmonics
13	Ch. 15: Gases and Kinetic Theory Ch. 14: Heat and Calorimetry
14	Ch. 16: Thermodynamics
15	Ch. 16: Thermodynamics Final Exam Review

RESOURCES FOR STUDENTS

We want you all to do well in this course. Several resources are available to help you toward this goal:

- **Textbook:** An excellent source of information. Read it, and work problems at the end of each chapter.
- **Classes:** Attend lectures and recitations. Ask questions, and get involved in the discussion. What you retain from these classes may surprise you.
- **Professor's Office Hours/Tutorial Sessions:** Make use of the scheduled office hours for help with homework problems and other matters that arise during the course. **Other times may be arranged by talking with any of us after class.** Please don't hesitate to contact your instructors for help at any time.
- **Course Material on the Web:** This syllabus, lecture notes, solutions to homework and exam problems, and important announcements can be found on the web via Blackboard. We have chosen several problems from each chapter to further emphasize the physics principles we think are important. We will post solutions to these problems on the web. They provide a useful resource to enhance your understanding of each chapter, to help with the homework assignments, and to act as further exam preparation material. Make use of these very useful resources!
- **Physics Department Consultation Sessions:** A graduate student is available to assist you with homework problems and preparing for the exams. The times for these sessions will be announced later.

SOME SENSIBLE ADVICE

We want everyone to have fun and do well this course. Unfortunately some people find doing physics difficult. Below are a few tips that might help out—please use them with wisdom!

- **“I hear and I forget, I see and I remember, I do and I understand.”** – old Chinese Proverb. People don't learn to swim without getting their feet wet. If you are going to learn Physics, **you must take the initiative** for your own learning.
- Seek to understand the concepts and how to use them.
- This course is not a pushover; physics is based on *understanding*, not remembering. We will do all we can to help you, but *you* must be prepared to put some serious effort into really understanding the **underlying concepts of WHY things work the way they do**. Only you will be able to tell whether you are truly

gaining that understanding or not! Remember the “blank paper practice test”! Try it on the worked out problems in BlackBoard and on some additional end-of-chapter problems to see if you have understood the concepts. Use the worked-out solutions not as a crutch in helping solve the problems, but rather as a way of grading your practice test to see how well the understanding has sunk in. You learn far more that way.

- **Attend all lectures**, especially the recitations. It is a demonstrated fact that there is a *strong* correlation between lecture attendance and student performance; in addition, you earn class participation points by attending and being involved in the lectures!
- The mini-exams form the most important component of the course. In order to prepare for those exams, make sure you understand and can do all the Homework problems and any additional recommended end-of-chapter problems.
- In answering any problem, always ask yourself, “Is the answer I just worked out sensible?” Remember to put units in throughout your calculations.
- **Use the book**; you paid good money for it. Take time to look over a chapter *before* it is covered in class. Take notes on what you read. Refer back to it as you do your homework and again when you prepare for each test. The Study Guide can also be quite useful.
- **Find a study partner.** We strongly encourage students to study together or in groups.
- When studying together, don’t always be the one having ideas explained to you. Try **explaining ideas to your friends**. Surprisingly, the one doing the explaining is always the one who learns the most from this process.
- Finally, don’t give up or sit for hours in vain trying to do the homework to no avail. **Come and see the faculty instructors (either me, or one of the lab TAs or recitation instructors) and ask questions**; usually you will be much closer than you think to solving the problem.
- If you are seriously thinking about dropping the course at any point, **please come and talk to your lecture professor first.**

UNIVERSITY POLICIES

UNIVERSITY ATTENDANCE POLICY

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

ACADEMIC HONOR POLICY

The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students’ academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “...be honest and truthful

and...[to] strive for personal and institutional integrity at Florida State University.”
(Florida State University Academic Honor Policy, found at
<http://fda.fsu.edu/Academics/Academic-Honor-Policy>.)

AMERICANS WITH DISABILITIES ACT

Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class. This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the: Student Disability Resource Center 874 Traditions Way 108 Student Services Building Florida State University Tallahassee, FL 32306-4167 (850) 644-9566 (voice) (850) 644-8504 (TDD) sdrc@admin.fsu.edu
<http://www.disabilitycenter.fsu.edu/>

FREE TUTORING FROM FSU

On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options at <http://ace.fsu.edu/tutoring> or tutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

LIBERAL STUDIES FOR THE 21ST CENTURY

The *Liberal Studies for the 21st Century* Program at Florida State University builds an educational foundation that will enable FSU graduates to thrive both intellectually and materially and to support themselves, their families, and their communities through a broad and critical engagement with the world in which they live and work. Liberal Studies thus offers a transformative experience. This course has been approved as meeting the **Liberal Studies** requirements for **Natural Sciences** and thus is designed to help you become a critical appraiser of the theories of the natural sciences and the facts that support them.

SYLLABUS CHANGE POLICY

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.