

Syllabus

Instructor: Dr. Carrie Menke, COB 305, cmenke@ucmerced.edu

Office Hours: see CROPS for the up-to-date schedule, or by appointment

Teaching Assistants: (see CROPS for office hours)

- Joshua Casara, jcasara@ucmerced.edu
- Gustavo Hernandez, ghernandez24@ucmerced.edu
- Leily Kiani, lkiani@ucmerced.edu

Lectures: MWF, 10:30 – 11:20am, COB 105

Discussion/Lab Sessions: Schedule on Registrar's Website

Section	Time	Discussion	Lab
21	6:30 – 8:30pm	Thursdays COB 262	Tuesdays S&E 107
22	10:30am – 12:30pm		
23	12:30 – 2:30pm		
24	2:30 – 4:30pm		
25	4:30 – 6:30pm		

MasteringPhysics Course ID: UCMPHYS8F12MENKE (for signing on the first time)

Required for Course:

The textbook, student workbook, and MasteringPhysics are bundled together and sold separately at the bookstore. You may purchase MasteringPhysics with or without the etext directly from masteringphysics.com. Clickers are available at the bookstore (and cheaper than what I've found online).

- Physics for Scientists and Engineers: A Strategic Approach, by Randall D. Knight (etext is fine)
 - Edition: either 2nd or 3rd (I'll be referencing the 2nd in class.)
- MasteringPhysics, an online tutoring and homework system.
 - Course ID: UCMPHYS8F12MENKE (for signing on the 1st time)
- Student Workbook for Physics for Scientists and Engineers
- Clicker

Course Description: Introductory Physics I for Physical Science & Engineering, a calculus-based introduction to classical mechanics for students with preparation in calculus and algebra. This course prepares students for further studies in physics for those majoring in the physical sciences and engineering. Topics include forces, kinetics, energy, momentum, gravity, rotations, oscillations, and fluids. Pre/Co-requisite: Math 011, 021 or ICP 001A.

CROPS site

The CROPS website (F12-PHYS 018 20) will be used extensively throughout the course. Look there for announcements, resources (i.e. lecture slides, worksheets, etc.), and grades. Also, the most recent course information, office hours, and contact information will be posted on the home page.

Course Goals: This course is designed to enable you, the student, to:

1. **Learn the basic principles and mathematical tools of Newtonian mechanics**
 - a. *Teaching Objectives:* We will present the definitions, language, and mathematical tools of classical mechanics through examples, demonstrations, and discussions of physical phenomena.
 - b. *Learning Outcomes:*
 - i. You should be able to demonstrate your expertise in this subject by utilizing the definitions, language, and mathematical tools (geometry, algebra, and calculus) to discuss classical mechanics problems verbally, in writing, and mathematically.
 - ii. You will most likely discover some misconceptions you have about the physical world and will be able to reconcile them with a correct understanding in classical mechanics.

2. **Learn applications of physics to real-world problems**
 - a. *Teaching Objectives:* We will demonstrate and coach you in the process physicists use to solve problems, and apply that process to solve problems in classical mechanics.
 - b. *Learning Outcomes:* You should be able to analyze a written problem or observed phenomena, simplify it, identify the key known and unknown features, make predictions, and evaluate those predictions based on the principles of physics.

3. **Develop the problem-solving perseverance required to succeed in the physical sciences & engineering.**
 - a. *Teaching Objectives:* We will reinforce the tools, methods, and material throughout the semester to prepare you for the second course in the series – Physics 009 – and beyond.
 - b. *Learning Outcomes:* By learning the basic techniques of problem solving and conscientiously expressing physical problems mathematically you will be well-prepared to study more advanced topics in physics.

4. **Connect textbook and lecture material to contemporary research topics**
 - a. *Teaching Objectives:* We will share our enthusiasm for physics – especially topics in classical mechanics – by connecting course material with real-world problems, demonstrations, and on-going research.
 - b. *Learning Outcomes:*
 - i. At the level of an introductory physics student, you will practice analyzing physical phenomena and reading research.
 - ii. Your interest in and appreciation for physics will hopefully increase throughout the course, regardless of your major.

Every component of the course is designed to reinforce these course goals:

Component of Course	Weight
A. Lecture Prep & Participation	5%
B. Homework	20%
a. MasteringPhysics Score: 10%	
b. Homework Notebook: 10%	
C. Discussion & Labs	15%
D. Midterms (3)	30%
E. Final Exam	20%
F. Research Summary	10%

Grades will be determined using the *approximate* framework: A: 85-100%, B: 70-85%, C: 55-70%, D: 50-55%. The flavor of letter grade (+, even, -) will be determined when final grades are assigned.

Course Components

- A. Lectures: Prep & Participation:** Lectures will be very interactive; include demonstrations, PowerPoint slides, clicker questions, work on the whiteboard; and begins on time. Come prepared, ask questions, and participate.
- a. **Lectures:** student success is strongly linked to lecture attendance & participation. Slides are posted on CROPS after lecture.
 - b. **Lecture Prep:** Specific preparation for the next lecture is given on the last slide of the previous lecture. Study the text *before* lecture; the schedule is posted on CROPS.
 - c. **Clickers:** 3-5 questions will be included in every lecture. Questions are used to check lecture preparation, provide feedback on your understanding, foster discussion, explore and clear up confusing aspects of the material, and to delve deeper into the course material. Questions are also periodically used to gather anonymous course feedback.
 - i. **Points:** 4 points for the correct answer. 3 points for an incorrect answer.
 - ii. **Clicker Policy:** It is your responsibility to bring your (and only your) clicker to every lecture, ensure that it is properly registered, working, and that it has working batteries. "Clicking" for a classmate will be considered a violation of the academic honesty policy.
 - iii. **Dropped score:** The lowest 6 daily clicker scores will be dropped before calculating your final grade. This will accommodate forgotten clickers, arriving late, dead batteries, clicker being set to the wrong channel, absence due to illness, etc.
- B. Homework**
- a. **MasteringPhysics (MP):** The weekly homework assignments are on MasteringPhysics.com, an on-line tutoring and homework system. The system provides immediate feedback on your answer, and many questions provide hints that guide you to the correct answer. When used correctly, this immediate feedback is a powerful tool to help you learn the material.
 - i. **Course ID: UCMPHYS8F12MENKE** (for signing on the first time)
 - ii. Due Fridays at 11:59pm unless otherwise noted.
 - iii. Instructions for signing onto MP and helpful hints are posted on CROPS/Resources.
 - iv. **Timing of HW versus Exams:** Sometimes the due date for a HW applicable to an exam is after the exam. We highly recommend you complete associated HW before the exam.
 - v. *Students that work the problem until they get the correct answer, understanding where things went wrong, (versus 'hunting and pecking' for the correct answer) tend to earn higher exam scores and higher course grades.*
 - b. **Homework Notebook:** MasteringPhysics grades only your answer. The homework notebook trains you to use a robust problem-solving process *and* creates a powerful study guide for you.
 - i. Examples and the rubric are posted on CROPS/Resources.
 - ii. The notebook must be bound and completely separate from notes and any other course material.
 - iii. During discussion, your TA will check your problem-solving process based on *one* problem in the notebook from the assignment due the previous Friday. The problem is not announced beforehand.
 - iv. *Students that spend the time writing up their homework legibly, explaining their reasoning, and working through each step of the problem-solving process tend to score significantly higher than average on exams and earn the higher grades in the course.*
 - c. **Dropped scores:**
 - i. **MasteringPhysics:** no MP scores are dropped.
 - ii. **HW Notebook:** the lowest 2 notebook scores will be dropped before calculating your final grade. This accommodates absences, etc. from discussion.
- C. Discussion & Lab**
- a. You must attend the discussion/lab session that you are officially enrolled in. No exceptions.
 - b. **Discussions:** Discussion sessions provide opportunities to hone your physics skills, and attendance is expected.

- i. The homework notebook will be checked during discussion.
- ii. You'll work in groups to discuss lecture material, review topics, and work problems with the guidance of your teaching assistant. Come prepared: bring discussion worksheets (posted on CROPS site), your textbook, notes, and questions.
- iii. **Grading:** Your TA will determine your discussion grade based on the quality of your work and participation during the discussion sessions. The discussion grades will be posted as "High Pass," "Pass," "Low Pass," or "Fail." A "Pass" will have a neutral effect on your course grade. A "High Pass" is in recognition of exceptional work and will raise your course grade by a flavor (i.e. C+ to a B-; however it will not change an A to an A+). A "Low Pass" results from poor attendance (including arriving late or leaving early), not coming prepared, and not participating fully; this score will lower your course grade by a flavor (but will not lower a C- to a D). "Fail" is the result of excessive absences and/or impeding the learning of others in discussion; zero credit for discussion will be applied when calculating the final grade.
- c. **Labs:** There are 9 labs. The lab sheets are posted on CROPS; print them out and bring them with you to lab. Lab sheets will be turned in at the end of the lab session. Check the schedule and make sure you attend every lab!

Lab	Prelab?
Kinematics 1	
Kinematics 2	
Vectors 1	YES
Vectors 2	
Dynamics	YES
Collisions	YES
Rotations	YES
Oscillations	
Rubber	YES

- i. **No lab scores will be dropped.**

1. If you miss a lab for an officially excused reason (major religious holiday, documented illness or family emergency, or official university business, etc.) the remaining labs will be used to calculate your lab grade. Bring documentation to Dr. Menke for the absence to be excused.
2. **An unexcused absence in a lab will drop your *course* grade by 3% in addition to being recorded as a zero in the CROPS Gradebook.**

- D. **Exams:** All exams will consist of qualitative and quantitative problems, based on homework, lecture material, discussion problems, and labs. See the course schedule for the dates and material covered on the exam. Only the final exam is explicitly comprehensive, but the course material builds upon itself.
- a. Bring a green ScanTron form for the exams (Form No. 882-E)
 - b. *There will be no early or make-up exams.*
 - i. If you miss an exam for an officially excused reason (major religious holiday, documented illness or family emergency, or official university business, etc.) your missed exam score will be replaced by the appropriately scaled score on the portion of the final exam that covers the same material as the missed exam. Bring documentation to Dr. Menke for the absence to be excused.
 - c. **Skipping the final exam will result in an automatic failure ('F') in the course.**
 - d. Exam Regrading:
 - i. If your score was tabulated incorrectly, please let your TA or Dr. Menke know and it will be corrected. *Once you leave the room after picking up your exam, you may not request a correction.*
 - ii. If you believe your exam was graded incorrectly you may request a regrade by writing a note on the cover sheet and turning the exam back to Dr. Menke (or your TA if returned during discussion). Dr. Menke will regrade the entire exam, which may result in a higher score, a lower score, or no change. *Once you leave the room after picking up your exam, you may not request a regrade.*
- E. **Research Summary:** Classical mechanics is one of the very basic subjects that constitute Physics, but it is far removed in many ways from current research areas and applications. You'll summarize a journal article to gain practice understanding science, demonstrate good writing skills, and become aware of current research.
- a. Details and information are posted on CROPS.
 - b. UC has strict rules about plagiarism, which guarantees severe action against the student. Refer to the Academic Honesty Policy for further information about plagiarism.

Course Policies

I. Late Work & Absences

- No late work will be accepted for any aspect of the course. No extensions are granted and there are no "make-ups" for any assignment, lab, or examinations. Refer to the specific section in the syllabus about whether any scores are dropped for that component of the course.
- Skipping the final exam will result in an automatic failure ('F') in the course.

II. Collaboration

As with swim teams, you'll train together then compete alone. Physics education research shows that collaborating helps you learn the material better and for longer.

- Train together: lecture participation, discussion group problems, labs, getting *feedback* on your research summary, homework assignments.
- Compete alone: exams

Are you ready to compete successfully? Practice solving problems and answering questions on your own. Can you do it solo? Yes? Then you're ready.

- ### III. Accommodations for Students with Disabilities:
- The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with the Disability Services Center to verify their eligibility for appropriate accommodations.

IV. Academic Integrity (summarized)

- **Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy.**
- *Any work submitted by a student in this course for academic credit will be the student's own work.* Collaborating is allowed in lecture, discussions, labs, and on homework.
- You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting" help or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e-mail, an e-mail attachment file, a diskette, or a hard copy. ***Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment.*** Penalty for violation of this Policy can also be extended to include failure of the course and University disciplinary action.
- During **examinations** you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. *Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.*
- **Plagiarism** will not be tolerated. Plagiarism refers to the use of another's ideas or words without proper attribution or credit. This includes, but is not limited to: copying from the writings or works of others into one's academic assignment without attribution, or submitting such work as if it were one's own; using the views, opinions, or insights of another without acknowledgment; or paraphrasing the ideas of another without proper attribution. Credit must be given: for every direct quotation; when a work is paraphrased or summarized, in whole or in part (even if only brief passages), in your own words; and for information which is not common knowledge. The requirement to give credit applies to published sources, information obtained from electronic searches, and unpublished sources. *Plagiarism will result in failure of the assignment, and may lead to failure of the course and University disciplinary action.*

- **Clickers:** Entering answers for another student using their clicker is considered a violation of the academic honesty policy.
- The full academic honesty policy is online. Go to studentlife.ucmerced.edu, click on Student Judicial Affairs, click on Academic Honesty Policy.

Advice & Additional Resources

How to Succeed in this Course: Characteristics of the most successful students include: *completing all of the work*; preparing for lectures, engaging in lecture, and reviewing lecture material; trying to figure out answers for themselves rather than have someone explain it to them; getting help if they cannot figure something out for themselves; working to understand the concepts behind the mathematical treatment; utilizing a thorough problem-solving process rather than a “plug-and-chug” method; using their own words and their own analogies to explain something rather than parroting the text or the lecture; and they’re not afraid to explore different paths to a solution. They don’t always get the right answer, but they always try. Successful students know that they’re responsible for their education. They tend to have a positive attitude about their ability to figure things out, even if things don’t come quickly or easily. Successful students ask questions; they don’t let the discomfort of potentially looking “stupid” (their word, not mine) get in the way of learning.

Time Commitment: Expect to spend 2 – 3 hours *in addition to* contact hours (i.e. lectures, discussions, and labs) for every credit in the course. For this 4-unit course, that’s 8 – 12 hours plus almost 7 contact hours. Being a full-time university student is more than a full-time job.

Getting Help: Get help earlier rather than later! We are here to help you succeed in this course. Honestly, we *love* when students rock this course. (And one of the many things I love about teaching is helping students get to the “a-ha” moment in understanding physics, which I think is an especially cool subject.) There are multiple options for getting help. *Please* take advantage of them.

- Lectures, discussion sessions, and labs: ASK QUESTIONS!! It’s a good thing.
- Office Hours: mine and the TAs
 - Bring course materials, especially your notes and homework notebook!
 - Check CROPS for updated times & locations.
 - You may attend my other classes’ office hours (unless otherwise noted). Just understand those students will get top priority.
 - I’ve been told I’m actually quite friendly and not nearly as intimidating as I seem during lecture. (I really don’t mean to be intimidating.)
- Open-door policy: I have a generally open-door policy. If I’m busy I’ll let you know it’s not a good time.
- Free tutoring through UCMerced’s Calvin E. Bright Success Center!
 - Check <http://learning.ucmerced.edu/> for the schedule.
- Additional Books (not required)
 - *Portable TA: A Physics Problem-Solving Guide, Volume I* by Andrew Elby
 - *Cracking the SAT Physics Subject Test* by Princeton Review
- Is the required textbook not working for you? Feel free to reference other textbooks!
- **Study Skills in Physics Meetings:** This is a periodic meeting where we discuss various study skills, strategies, time management, and what it means to learn, all in the context of the physics course. The goal is for the skills to be immediately applicable and useful in other courses, too. It’s completely voluntary, casual, and you can drop in anytime during the semester.