

SYLLABUS

COURSE DESCRIPTION

PHYS122 is the second semester of calculus-based introductory physics course. The goals of this course are to help you:

- Understand basic concepts and ideas in thermodynamics, electricity, magnetism and circuit
- Apply physics concepts and use appropriate mathematics in physical world
- Learn to think rationally and coherently
- Develop problem-solving skills
- Prepare for the following courses

PREREQUISITES You must have passed PHYS121 with a grade C or better

INSTRUCTOR CONTACT INFO

Dr. Lili Cui Office: 321 Physics Phone: (410) 455-2535
Email: lili@umbc.edu

Office hour: M&W 1-2 pm; Tu 10:30-11:30 am; in room 226 Physics
Visiting my office hour is the best way of contacting me; the time is set aside for you. Physics related questions should be posted on the Discussion Board in Blackboard instead of personal email. I do not answer specific physics questions through email due to the large class size. For other questions, email is a great method of contact. Please include your full name, course and discussion number, and give detailed information, use your UMBC email address to ensure response.

REQUIRED TEXTBOOK & OTHER MATERIAL

- *Physics for Scientists and Engineers*, by Randall D. Knight, 2nd ed.
- *Tutorials in Introductory Physics*, by L. C. McDermott and P. S. Shaffer, 1st ed.
- *MasteringPhysics (MP)*: Available online and at UMBC bookstore
- *CPS Response Pad (clicker)*: Available at UMBC bookstore
- Pen/pencil, notebook, a clear and focused mind, good attitude...

SUCCESS STRATEGY

- Be sure you have the time required for the course. You are expected to attend all classes – lectures and discussions. In addition, experience shows that success requires *at least 8 hours of intensive effort* outside of class – more for those with weaker preparation or less effective study skills.
- Physics is about understanding, not memorization. Instead of only paying attention to results, it is more important to understand how you get results. We're going to learn how to "think science" rather than just to remember the procedures or results.
- You also have many resources including the textbook, study group, your friends, teaching assistants, me, YouTube and more. Use them wisely.
- It is essential to develop an ability to think and learn for yourself. You must be actively engaged to learn the material, you cannot passively watch me or your classmates and expect to understand the concepts and develop problem solving skills. Cognitive science has proven that the mind must interact to learn.

Success in the course is not "a piece of cake", but can be achieved with effort and the right strategies.

POINT ALLOCATIONS

Type of Assignment	Maximum Points
In Class Participation & Quiz	20 (5.00%)
Discussion (scaled to)	60 (15.0%)
Homework (scaled to)	40 (10.0%)
Exam	200 (50.0%)
Final Exam	80 (20.0%)
<i>Total</i>	400

LECTURES

- You are expected to read the related textbook sections prior to every lecture; it makes for much more efficient learning. The class time will be spent on clarifying and applying the material.
- The lecture PowerPoint slides will be posted on Blackboard the night before every lecture. You are expected to print them out to take lecture notes on; it gives you the structure of every lecture and facilitates the note-taking process. But remember these slides are not the complete content of the class but only an outline, printing them out is not a substitute for attending lectures.
- Your participation (not merely attendance) in the lectures is required with the use of clicker. You need to bring your clicker (with good battery) to every class. If you attend class but forget your clicker, you do not get participation points. Because unforeseen events do happen, you will be given five “free” days for not clicking. These count towards ALL absences and clicker malfunctions.
- If you miss one lecture, you are responsible for finding out what was done.

LECTURE HOMEWORK

- A major part of what I expect you to learn in this class will come as a result of doing homework. You need to fully *understand* how to solve the assigned homework problems to do well on the exams and to succeed in this course. You are encouraged to work together since the homework problems are not easy, however, you must fully understand how to solve problems on your own.
- Lecture homework are collected through the online homework system—MasteringPhysics (MP). Homework will be assigned every Wednesday after lecture and will be due the next Wednesday at midnight. Solutions will be posted on the Blackboard site soon after they are due. As a result, *late homework will not be accepted*. Full credit is assigned for completing 85% of the total points. This allows you to look at hints, try a few times, and miss a few questions for whatever reasons. Since the main purpose is to prepare you for the exams, keep a careful written record of your work for future studying. Selected written solutions may be collected during lectures on Fridays and will be graded in detail.
- There will be two types of homework problems – tutorial questions and end-of-chapter (EOC) problems. Tutorial questions provide guidance in doing and EOC problems originate in the back of the book, numbers are randomized for your individual assignment. Tutorial questions should help with EOC problems and should be done first. Note although most of the tutorial questions are assigned with no credit to allow you to make mistakes, you are responsible to solve them all to prepare for exams.

DISCUSSION

- You must attend the discussion that you are officially registered for.
- Full attendance is required for every discussion.
- *Tutorials in Introductory Physics* is required for every discussion.
- Your discussion instructor will give specific guidelines.

EXAM

- There will be four midterm in class exams, see the schedule for the dates.
- If you have to miss an exam because of serious illness, family emergency, detention by authorities or other insurmountable difficulty, please contact me as soon as possible. Written verification of the causes of your absence will be needed to take the make-up exam.

FINAL EXAM

The final exam will be comprehensive and can't be rescheduled. There is no makeup exam for the Final and no one will be allowed to take the final on a different time.

COURSE GRADE

I do not grade on a curve, so your grade is not dependent on the performance of your classmate. Help each other and learn from each other.

Points Scored in Course	Course Grade
358 or Above	A
306-357	B
250-305	C
200-249	D
199 or Below	F

Check your grades on Blackboard routinely. You need to review your points for clicker participation, homework, discussion section and exam as soon as they are returned to you. Please contact me, grader or your discussion instructor for any grading mistakes ***within one week***.

COURSE WEBSITE

I will put all my teaching materials in the Blackboard website. After log in myUMBC, click on the "Blackboard" tab and then click on "PHYS122_SP2010" in the "My Courses" area. You will use the website for:

- Accessing course materials: syllabus, schedule, lectures notes and etc.
- Checking the course Announcements.
- Checking the Points that you have earned in the course so far.
- Interacting with the instructor and others online using Discussion Board.

You are ***required*** to logon to the course website ***at least once between lectures***. **You are responsible for all content delivered via Blackboard.**

Please contact DoIT Helpdesk (410-455-3838, room 020 Engineering building) for assistance with computer problem.

IMPORTANT DATES

- Feb 09: Last day to add a class
- Feb 23: Last day to drop without a grade of "W"
- Apr 14: Last day to drop with a "W" on transcript

CLASSROOM COURTESY

Every student deserves a good learning environment.

- Arrive at lecture and discussion on time, pack and leave when the instructor says class is over.
- Turn off or silent your cell phone before entering.
- Do not talk during the class to distract your fellow students or me, unless you are asked to discuss questions.
- Respect each other.

TUTORIAL CENTER (FREE)

- The Physics Tutorial Center (PTC) is on a walk-in basis and provides one-to-one help. It is located in physics 226 (the discussion room). See my Blackboard announcement for updated schedule.
- The Learning Resource Center (LRC) located on the fourth floor of Academic IV supplies private tutors. Please contact the LRC at (410) 455-2444 or visit <http://www.umbc.edu/lrc/> to make individual arrangement.

ACADEMIC INTEGRITY

"By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook."

DISABILITIES

- If you have any condition such as a physical learning disability, which will make it difficult for you to carry out the work as I have outlined it or which will require academic accommodations, please notify me in the first two weeks of the course.
- If you are taking the exam with the Student Support Services, inform me by email with the detailed information at least 48 hours before *every* exam so I have time to make accommodation accordingly.

SCHEDULE

	Date	Lecture Topic	Textbook	Discussion
Week 1	Jan 27 (W)	Ideal-Gas Law & Processes	16.1-16.6	No Discussion ☺
	Jan 29 (F)	Work in Ideal-Gas Processes	17.1-17.2	
Week 2	Feb 01 (M)	Heat & 1 st Law of Thermodynamics	17.3-17.5	Ideal Gas Law
	Feb 03 (W)	The Specific Heats of Gases	17.7	
	Feb 05 (F)	Micro/Macro Connection	18.1-18.4	
Week 3	Feb 08 (M)	Heat Engine	19.1-19.3	First Law of Thermodynamics
	Feb 10 (W)	The Limits of Efficiency	19.5-19.6	
	Feb 12 (F)	Exam 1		
Week 4	Feb 15 (M)	Charge & Electric Force	26.1-26.5	Charge
	Feb 17 (W)	Electric Field	27.1-27.2	
	Feb 19 (F)	E. Field of Continuous Charge Distributions	27.3-27.4	
Week 5	Feb 22 (M)	Uniform Electric Field	27.5-27.7	Electric Field and Flux
	Feb 24 (W)	Electric Flux	28.1-28.3	
	Feb 26 (F)	Gauss's Law	28.4-28.5	
Week 6	Mar 01 (M)	Electric Potential and E. Potential Energy	29.1-29.6	Gauss's Law
	Mar 03 (W)	Electric Potential of Continuous Charge Distributions	29.7	
	Mar 05 (F)	Connecting Field and Potential	30.1-30.3	
Week 7	Mar 08 (M)	Conductors in Electrostatic Equilibrium	30.4	Electric Potential Difference
	Mar 10 (W)	Applications		
	Mar 12 (F)	Exam 2		
Week 8	Mar 15-19	Spring Break ☺		
Week 9	Mar 22 (M)	Capacitor	30.5-30.6	A Model for Circuits: Part I
	Mar 24 (W)	Dielectrics	30.7	
	Mar 26 (F)	Electric Current	31.1-31.5	
Week 10	Mar 29 (M)	Ohm's Law	32.1-32.2	A Model for Circuits: Part II
	Mar 31 (W)	Energy and Power	32.3	
	Apr 02 (F)	DC Circuit	32.4-32.8	
Week 11	Apr 05 (M)	RC Circuit	32.9	RC Circuit
	Apr 07 (W)	Applications		
	Apr 09 (F)	Exam 3		
Week 12	Apr 12 (M)	Magnetism	33.1-33.2	Magnets and Magnetic Field
	Apr 14 (W)	Magnetic Field of Moving Charge	33.3	
	Apr 16 (F)	Magnetic Field of Currents	33.4-33.5	
Week 13	Apr 19 (M)	Ampere's Law	33.6	Magnetic Forces
	Apr 21 (W)	Magnetic Force	33.7-33.8	
	Apr 23 (F)	Applications	33.9	
Week 14	Apr 26 (M)	Induced Current	34.1-34.3	Lenz's law
	Apr 28 (W)	Faraday's Law of Induction	34.4-34.5	
	Apr 30 (F)	Lenz's Law	34.6-34.7	
Week 15	May 03 (M)	Inductors	34.8	Faraday's Law and Applications
	May 05 (W)	LR & LC Circuit	34.9-34.10	
	May 07 (F)	Exam 4		
Week 16	May 10 (M)	Maxwell's Equations	35.1-35.4	Electromagnetic Waves
	May 12 (W)	Electromagnetic Wave	35.5-35.6	
Final	May 19 (W)	Final Exam (comprehensive) 10:30 AM – 12:30 PM, LH5		