

PHYS 112-1
Basic Physics II
John F. Jacobson
UMBC Summer II 2012
Course Syllabus

•Getting ready•

Prerequisites: PHYS 111.

Workload: Because of the compressed schedule for summer classes we will cover in one day what PHYS 112 would normally cover in one week. This means that you need to budget sufficient time outside of class to master the course material. Expect to spend at least sixteen (16) hours per week outside of class and laboratory working on PHYS 112. More time will be needed for those with weaker preparation or less effective study techniques.

Text: *College Physics: A Strategic Approach* by Knight, Jones, and Field, 2nd ed.,
RealTime Physics Custom Lab Man. Mod. 3+, Sokoloff.

Registering for MP: Go to <http://masteringphysics.com/> and click *Register*. Enter your access code. The ID for this course is MPJACOBSON09527. (If you have used MP previously log in with your user name and password.) Enter your UMBC Student ID # when MP prompts you for an ID.

Good Stuff: Scientific calculator and straight edge. Hole punch and 3-ring binder to help keep you organized.

Class: Lecture: MoWeTh 9:00 – 11:15 AM in Physics, Room 101.
Laboratory: 112-02: MoTh 11:30 AM – 1:20 PM in Phys 109
112-03: MoTh 2:00 – 3:50 PM in Phys 109

•Goals and Methods•

Learning Goals: Basic Physics II is intended to provide a basic knowledge of physics for those majoring in the life sciences and other non-technical majors. The course goals are for you

- (1) to be able to acquire, analyze, interpret and model experimental data using modern computer tools,
- (2) to demonstrate a basic understanding of the concepts of electrostatics, electric current, magnetism and electromagnetic induction, waves and sound, light and optics, and modern physics,
- (3) to aptly and flexibly employ scientific reasoning skills and mathematical techniques,
- (4) to employ a systematic approach to analyzing and solving physics situations,
- (5) to communicate your reasoning process using clear written expression, and
- (6) to transfer understanding of physics to bioscience topics.

Blackboard (BB): Blackboard is the primary sources of information for this course. This is where you will gain access to course materials, announcements, helpful advice, and discussion forums with your fellow students. Check it frequently! To access BB go to *myUMBC*, click the *Blackboard* tab, and then click “PHYS 112 Basic Physics (Instructor: John Jacobson)” in the *My Courses* area.

Lecture: The course schedule (located at the end of this document) provides the topics that will be discussed at each meeting. It is essential that you read this material before coming to class. A Power Point outline of the important points of each chapter will be provided in BB after the lecture. Lectures will focus on developing your understanding of the more difficult concepts of the material, modeling scientific reasoning, and developing systematic problem solving skills, not on delivery of basic content. Attendance at lecture is expected.

Laboratory: The central concepts of the course are illustrated in the laboratory sessions through direct experience with the physical world. Your grade for each lab is based on a prelab that’s due at the beginning of the session, full attendance and participation in the session, and lab homework due at the beginning of the next session. Lab homework will only be accepted if you complete the related lab. You must attend the session that you’re officially registered for. Questions about the laboratory assignments, schedule, or grading can be answered by your Laboratory TA.

Exams: Four (4) class exams and a comprehensive final examination will be given during the course. The examinations will consist of problems and conceptual questions requiring you to explain your reasoning to analyze physical situations. Laboratory activities and homework, reading, and lecture will help you acquire the understanding and skills you’ll need to succeed on these examinations. All needed quantitative relationships (aka. Equations) will be provided with each examination. Examinations will be closed book and closed notes. Because of the rapid pace of the course and the short summer session it will be impossible to offer make-up examination. Plan now to be able to attend the scheduled examinations.

If you have a Student Support Services (SSS) approved accommodation for testing you must notify me on the first day of class and prior to any examination. It is your responsibility to make an appointment to take the examination at SSS. I will deliver and pick-up the examination at SSS.

Homework: Homework assignments are designed to build conceptual understanding of course material, develop scientific reasoning skills, and provide practice and feedback with systematic problem-solving. Homework assignments can be found in *Mastering Physics*. The online portion must be submitted by 5:00 PM on the due date specified. The instructor-graded problems are due at the beginning of class on the due date. Your homework solutions are the primary reference materials for physics problem solving when preparing for examinations. It is important that you keep a copy of your entire solution for MP problems as a study aid.

•Policies•

Grading: Your final grade (G) will consist of your averages for each portion of the course weighted as follows: 50% for the 4 class exams, 20% for the final examination, 20% for lab, and 10% for homework (HW). An overall average of $\geq 90\%$ will be required for an “A”, $89\% \geq G \geq 80\%$

for “B”, $79\% \geq G \geq 70\%$ for “C”, and $69\% \geq G \geq 60\%$ for “D”. An overall average of $<60\%$ will result in a failing grade.

Reclaiming and Reviewing Work: Homework will be returned during laboratory sessions. Solutions to instructor-graded homework problems will be posted on BB. Lab homeworks are returned to you at the beginning of lab. Exams are returned to you in your next lab session, or after that, during my office hours. Lab homework answers will be posted on BB/*Course Documents*. Exam solutions are posted on BB/*Course Documents* the day after the exam has been administered to all students. Notify the grader of any questions on grading as soon as possible. (Examine the posted solutions before questioning your grade on a problem.) Contact your lab TA about lab grading questions.

Making up work: Because of the concentrated schedule of summer school it is nearly impossible to make-up work. It is expected that you make every effort to submit work on time. If you must miss an exam or other assignment due to officially sanctioned UMBC activities, illness, family emergency, detention by authorities, or another difficulty, contact me as soon as possible. Please note that your work schedule is not an acceptable reason to miss an assignment particularly an examination or laboratory.

It will be nearly impossible to make-up a missed examination. If you must miss an exam due to officially sanctioned UMBC activities, illness, family emergency, detention by authorities, or another difficulty, contact me as soon as possible. I must be notified that you will miss a scheduled examination before the start of the examination. You must present written verification of the cause of your absence and arrange a makeup exam over the same material.

If you must miss a lab, you may submit the homework from the previous lab at the next scheduled laboratory session along with a note explaining your absence. It is your responsibility to re-schedule a missed lab with the Laboratory Assistant. Those who will represent UMBC in officially sanctioned university activities should speak with me as soon as possible to address possible conflicts. Homework assignments missed should be submitted at the next lecture after the missed day.

Academic integrity: All instances of academic misconduct will be addressed according to the UMBC Policy on Academic Integrity (<http://www.umbc.edu/integrity/students.html>). Examples include attempting to make use of disallowed materials on exams, attempting to communicate with anyone other than the instructor or TA during an exam, altering graded work and submitting it for regrading, asking someone else to take an exam in your place, copying or paraphrasing another's work on homework, asking someone else to do homework and representing it as your own, and permitting or assisting another student to carry out any of the above. Penalties range from a grade of 0 on a homework or exam to an F in the course (at my discretion), and from denotation of academic misconduct on the transcript to expulsion (as determined by official hearing of the Academic Conduct Committee.)

Courtesy: Cell phones, pagers, ipods, ipads, gaming consoles, and other electronic devices must be turned off during class.

•Getting help•

There are several ways to get help. They include:

- Contact me: (1). See me office hours in the Physics Tutorial Center (PHYS 226):
Mo: 12:00-3:00 PM, We: 8:00 – 8:50 AM, Th: 8:00 – 8:50 AM.
(2). e-mail at jacobso1@umbc.edu. I'll try to answer within 24 hours.
(3) Make an appointment to see me in my office (Physics 313).

The TA's will also be available to help you. Their schedule will be provided at the start of classes.

Form or join a study group. Research has shown that learning as a group results in better grades for all. (Besides, why suffer alone?)

Attend the help sessions offered before each class exam.

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Class Schedule

Week of:	Monday	Wednesday	Thursday	Laboratory
9 July 2012 Week 1	07/09/2012 Course Introduction and Expectations Chapter 20: Electric Forces and Fields	07/11/2012 Chapter 21: Electric Potential HW-1 Due	07/12/2012 Chapter 22: Current & Resistance HW-2 Due	Mo: LAB I: EC 1-Batteries, Bulbs, & Current (Prelab 2.5 only, HW 2.6 only) Th; LAB II: EC 2-Current in Simple DC Circuits (HW 3-7 only)
16 July 2012 Week 2	07/16/2012 Chapter 23: Circuits HW-3 Due	07/18/2012 Chapter 24: Magnetic Fields and Forces EXAM I (CH 20-22)	07/19/2012 Chapter 24: Magnetic Fields and Forces Chapter 25: Electromagnetic Induction HW-4 Due	Mo: LAB III: EC 3-Voltage in Simple DC Circuits & Ohm's Law Th: LAB IV: EC 5-Introduction to Capacitors and RC Circuits
23 July 2012 Week 3	07/23/2012 Chapter 25: Electromagnetic Induction HW-5 Due	07/25/2012 Chapter 15: Traveling Waves & Sound HW-6 Due	07/26/2012 Chapter 16: Superposition & Standing Waves EXAM II (CH 23-25)	Mo: LAB V: Action Potential Th: LAB VI: LO 1-Introduction to Light
30 July 2012 Week 4	07/30/2012 Chapter 16: Superposition & Standing Waves HW-7 Due	08/01/2012 Chapter 17: Wave Optics Section 28.1: X-rays & X-ray Diffraction HW-8 Due	08/02/2012 Chapter 18: Ray Optics EXAM III (CH 15-16)	Mo: LAB VII: LO 6-Waves of Light (HW1, 3-4 only) Th: LAB VIII: LO 5-Polarized Light

6 August 2012 Week 5	08/06/2012 Chapter 18: Ray Optics HW-9 Due	08/08/2012 Chapter 19: Optical Instruments Chapter 29: Atoms & Molecules HW-10 Due	08/09/2012 Chapter 28: Quantum Physics EXAM IV (CH 17-19)	Mo: LAB IX: LO 2- Reflection and Refraction of Light Th: LAB X: LO 3- Geometrical Optics – Lenses (HW 1-2 only)
13 August 2012 Week 6	08/13/2012 Chapter 29: Atoms & Molecules Chapter 30: Nuclear Physics HW-11 Due	08/15/2012 Chapter 30: Nuclear Physics Review for Final Exam HW-12 Due	08/16/2012 PHYS112 FINAL EXAMINATION	Mo: LAB XI: Human Eye Th: No Lab