PHYS 122H

Honors Introductory Physics II Discussions

Instructor: Dr. Jose Vanderlei Martins **Office Hours/Contact: Thurs 2:00-3:00** **Mon: 4:30-5:30** **Physics Building – room 429** **Phone: 410-455 2764** martins@umbc.edu	**Lectures Time/Place:** Mon: 2:30-4:20 at the University Center UC115D (CASTLE).
Grading Method: 10% of Phys122 Lectures (40 points) Homework (15 points), Project (15 points), Class participation and quizzes (10 points)	**Required Texts:** The textbook requirement is the same as the Phys 122 Introductory Physics II Lecture course

Class Notes: Though some course materials will be distributed in class and made available online, the students must have a notebook and take notes during classes. Several of the discussions based on real time questions have information that should be noted by the students.

Detailed Syllabus

- **PHYS 122H** ***Honors Introductory Physics II - Discussions***

  This course emphasizes electricity and magnetism. Topics include Coulomb's law, Gauss's law, electric fields and electric potential, currents, simple circuits and Kirchhoff's laws, generation of magnetic fields by charges in motion, electromagnetic induction, magnetic materials, oscillatory circuits, and electromagnetic waves.

  Collaborative activities in your weekly discussion are designed to help elaborate and cement the central concepts of the course. Activities include computational modeling (employing VPython), hands-on experiences, and whiteboard problem-solving. All are delivered and submitted via WebAssign and due at the end of discussion. This honor section distinguishes from the regular discussion sections by the addition of special discussion topics a final course project that will be required from the honor students and mentored directly by the instructor.

  The main program will follow closely the topics and schedule presented in the Phys 122 Lecture session (see attached schedule)

  Prerequisite: PHYS 121

• Day-by-day guide for Phys 122 Lecture Session •

Week:	Monday	Discussion	Wednesday	Friday
26-30 Jan	*Stationary charges* Ch 14 Electric field	Computational modeling: Introduction to VPython for E&M	**RQ (Syllabus, Appendix A Review of vectors (See BB/ Course Documents), Ch 14) due** Ch 14 Electric field	Ch 14 Electric field **Quiz 1 (14.1-4)**
2-6 Feb	**RQ (Ch 15) due** Ch 15 Electric fields and matter	Computational modeling: Electric field of a point charge Activity: Charge on tape	Ch 15 Electric fields and matter	Ch 15 Electric fields and matter **Quiz 2 (15.1-5)**
9-13 Feb	**RQ (Ch 16.1-9) due** Ch 16 Electric field of distributed charges	Computational modeling: Electric field of a dipole Whiteboard problem: Estimating the polarizability of a carbon atom, Charges on a rod	Ch 16 Electric field of distributed charges	Ch 16 Electric field of distributed charges **Quiz 3 (16.1-4)**
16-20 Feb	**RQ (Ch 17.1-7) due** Ch 17 Electric potential	Computational modeling: Electric field of a uniformly charged rod Part 1 Whiteboard problem: Electric field of a rod Activity: Measuring potential differences	Ch 17 Electric potential	Ch 17 Electric potential **Quiz 4 (17.1-4)**
23-27 Feb	**RQ (Ch 17.8-9) due** Ch 17 Electric potential	Whiteboard problems: Potential difference problems I and II	Ch 17 Electric potential Help session 12-12:50 Eng 027	**Exam 1 (Ch 14-17)** *at 8 AM; check BB for your assigned lecture hall and seat.*
2-6 Mar	*Moving charges – Magnetic fields* **RQ (Ch 18.1-10) due** Ch 18 Magnetic field	Computational modeling: Magnetic field of a moving charge Activity: Magnetic field of a long wire (1-4 only)	Ch 18 Magnetic field	Ch 18 Magnetic field **Quiz 5 (18.1-7)**
9-13 Mar	*Moving charges – Circuits* **RQ (Ch 19) due** Ch 19 Electric field and circuits	Whiteboard problems: Parallel wires, Triangular coil, Magnetic field of coils	Ch 19 Electric field and circuits	Ch 19 Electric field and circuits **Quiz 6 (19.1-4)**
16-20 Mar				

23-27 Mar	**RQ (Ch 20.1-7) due** Ch 20 Circuit elements	Activity: Energy conservation in circuits; Whiteboard problems: Electric field and current, Potential difference, Electric field in circuits, Charging capacitor	Ch 20 Circuit elements	Ch 20 Circuit elements **Quiz 7 (20.1-2)**
30 Mar- 3 Apr	*Moving charges – Magnetic force* **RQ (Ch 21.1-4) due** Ch 21 Magnetic force	Activity: DC and RC circuits	Ch 21 Magnetic force	Ch 21 Magnetic force **Quiz 8 (21.1-4)**
6-10 Apr	**RQ (Ch 21.5-9) due** Ch 21 Magnetic force	Computational modeling: Moving charged particle in a magnetic field Activity: Magnetic force on wires Whiteboard problem: Hall effect	Ch 21 Magnetic force Help session 12-12:50 Eng 027	**Exam 2 (Ch 18-21)** *at 8 AM; check BB for your assigned lecture hall and seat.*
13-17 Apr	*Patterns of field in space* **RQ (Ch 22.1-7) due** Ch 22 Patterns of field in space	Whiteboard problems: Gauss's law, Outside the box, Gauss's law exercises, Gauss's law near a capacitor	Ch 22 Patterns of field in space	Ch 22 Patterns of field in space **Quiz 9 (22.1-4)**
20-24 Apr	*Time-varying fields and accelerated charges* **RQ (Ch 23.1-6) due** Ch 23 Faraday's law	Whiteboard problems: Faraday's law exercises, Faraday's law problems	Ch 23 Faraday's law	Ch 23 Faraday's law **Quiz 10 (23.1-2)**
27 Apr-1 May	**RQ (Ch 24.1-6) due** Ch 24 Electromagnetic radiation	Review	Ch 24 Electromagnetic radiation	Ch 24 Electromagnetic radiation **Quiz 11 (24.1-2)**
4-8 May	Ch 24 Electromagnetic radiation	Makeup week	Ch 24 Electromagnetic radiation Help session 12-12:50 Eng 027	**Exam 3 (Ch 22-24)** *at 8 AM; check BB for your assigned lecture hall and seat.*
11-15 May	Review			**Final Exam (comprehensive)** *10:30 AM-12:30 PM* *15 May in Eng 027; check BB for your assigned seat.*

Course Project

Students are supposed to propose and work on a small course project for the Honors Introductory Physics II discussion class. The project grade will account for 3/8 of the final grade for the discussion section. The project can be experimental, theoretical, conceptual, computational, etc, and it is encouraged to be related to a research project in which the student is involved or is interested in getting involved with. Although the project may or may not be completely finished by the end of the course, students are supposed to present a brief final report that describes the idea, the developments executed along the course, and plans for continuation (if the project is to continue). The main requirement is that the subject of the project must be related to material covered in class.

Students are encouraged to connect this project with other activities they may be already involved with (other courses, research opportunities, etc.).

More information will be posted in the course's webpage as it becomes available.

- Student groups will be required to make a presentation of their project at the end of the course. The presentation will be scheduled at the end of the semester.

- Projects must be connected to the subjects covered in class. In particular, the project must cover topics related to electric charges, electricity, electrical circuits, magnetism, electromagnetic radiation or waves.

Policies & Expectations

Policy on Attendance

Students are **strongly encouraged to attend** all the discussion sessions. Much of the material discussed in class is not in your textbook. Students are expected to bring a notebook to class and take notes of the most important points. Attendance, participation in the discussion activities and general participation in the class counts towards your grade.

A note on **Classroom Etiquette**: You are expected to show the professor and your fellow students respect. You are expected to arrive prior to the start of the lecture, and not to leave until after the end of the lecture. You are expected to pay attention to the lecture, and usually to take notes. Behavior such as reading non-course related material, wearing headphones, disrupting fellow students *etc* are unacceptable. *If* you need to clarify a point with your neighbor, please do so in a "hushed manner". You are encouraged to ask questions, but to do so you are expected to raise your hand & wait to be called upon.
Please turn cell-phones OFF prior to entering the lecture hall.
Please do NOT use cell phones or browse the internet during class

Policy on Exams & Quizzes:

Make sure you **read & understand the "rules" and consequences of academic misconduct** (see below).

Policy on Grading *etc*

Dr Martins will determine all final grades. Your final grade is based on your actual total score. The grade will account for 10% of Phys122 Lectures (40 points)
Grade Distribution: Homework (15 points), Project (15 points), Class participation and quizzes (10 points)

You have one week from receiving a grade to appeal.

Academic (Mis)Conduct

Cheating will not be tolerated. We all know what that means, so I am not going to list all the possible "dos & donts". However here are a few pointers:

Quizzes & Exams (when apply) are to be completed **alone** (*not with the help of your neighbors*), aided only by a (non-programmable) calculator (*no notes, books, PDAs etc*).
Lab Reports (when apply) are to be completed by yourself and **must accurately reflect the experiment you performed & results as you obtained** (*not the results you think you should have obtained*).

A note on 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.

The consequences of misconduct will be severe, and may be reported to the Academic Conduct Committee. **If you are uncertain as to whether something is allowed: ASK FIRST!!**

See also this link on academic integrity: http://www.umbc.edu/undergrad_ed/ai/

Students are expected to be familiar with the Policies & Expectations of this course, and all UMBC regulations.

Phys 122H Calendar - Spring 2015

Jan 26	**First Day of Classes**
Feb 6	**Last day to add a class**
Feb 6	**Last day to drop a class without a grade "W"**
Mar 15-22	**Spring break**
Apr 12	**Last day to drop with "w"**
May 4-11	**Project presentations**
May 12	**Last day of classes**