Summer 2020

PHYS 121-450: Physics II

Ion Cohanoschi

Summer 2020 Physics 121-450 Course Syllabus (Rev 1.1)

Instructor:

- **Ion Cohanoschi: T-323A, icohanos@njit.edu**

Office hours: Tue, Wed, Thu: 10:30AM-12:00PM. Other times by appointment

Course Structure:
This course is conducted entirely online, which means you do not have to be on campus to complete any portion of it. You will participate in the course using NJIT's learning management system called **CANVAS** (**https://canvas.njit.edu**).

COMPUTER REQUIREMENTS
You will need to have a webcam, an up-to-date browser, operating system and some additional software on your computer to take this class. We will meet online on Webex each Tue, Wed, and Thu at 12:00PM-3:00PM. My Webex number is **927875524**. Also, you can use my Webex link which is posted on Canvas.

Course Communications:
ANNOUNCEMENTS
Announcements will be posted in CANVAS on a regular basis. They will appear on your CANVAS dashboard when you log in and/or will be sent to you directly through your preferred method of notification from CANVAS. Please make certain to check them regularly, as they will contain any important information about upcoming projects or class concerns.

Pre-requisites (all with grade of C or better):

- **Physics 111 or 111H, and Math 111, 111H, or Math 132 (Calculus-I)**

Co-requisites:

- **Physics 121A (the lab course) and Math 112 (Calculus-II) or Math 133.**

Physics 121A Laboratory must be taken along with Physics 121 unless you passed it previously. **If you drop Physics 121 you automatically drop the lab (and vice versa, no exceptions).** The Lab is otherwise a totally separate course from Physics 121 in that the lab instructors set the requirements and grades. The lab manual (Physics 121A Laboratory Manual 9th Edition) should be purchased at the bookstore. The most up-to-date lab schedule is posted at http//:web.njit.edu/~smm8166.

Materials for Physics 121:

- **Textbook** (**Abbreviation: Y&F**)**:** "**University Physics", 13th Edition**, authors **Young & Freedman** (Pearson 2012). We use Chapters 21 to 31, which are published as bound, 3 hole binder, and E-text versions. We will not be using the new 14th Edition of the text with the same name. You can find edition 13 at the bookstore, used or new.
- **Mastering Physics Online Homework System:** Each student must obtain an access code kit that allows use of the online homework system. In addition to using the access code, each student must enroll in the Mastering Physics (MP) course for his/her Physics 121 section using a course identifier code to be supplied by each instructor.
- Homework assignments and tutorials posted on-line in Mastering Physics will be automatically graded. Specific information will be available directly from all the instructors, and/or their web sites.
- The NJIT bookstore will stock Volume 2 text bundles (chaps 21-37 bound with the access code and E-text kit - **ISBN = 0321928814 or 9780321928818**). Any other version of the text containing Chapters 21 – 31 is OK. Any access code kit bought separately must be for the right text, specified above, so check before you buy.

Learning Outcomes: This course is the second of the calculus-based introductory Physics series.

- You can expect to have learning outcomes assessed by means of 2 partial exams, a final exam, scores on homework assignments and a small class participation score.
- The principal learning outcome is to demonstrate understanding and mastery of classical electricity and magnetism up to AC circuits, not including Maxwell's Equations or beyond. The subject matter areas you will be assessed on include electric charge, electric and magnetic fields, forces on stationary and moving charges and currents due to electrostatic and magnetic fields, electrostatic potential and potential energy, Gauss' Law, capacitance, current, resistance, DC

circuits, the Biot-Savart Law, Ampere's Law, Faraday's Law, inductance, RC circuits, LR circuits, LCR circuits, AC circuits including Phasor diagrams and resonant oscillations.

- In any/all of the above subject areas, you should be able to:
    - recall and use the conceptual and mathematical definitions and be able to explain them.
    - explain the conceptual and mathematical relationships between quantities used.
    - use symmetry arguments, sketches and diagrams, graphs, field maps, algebra, trigonometry, and basic integral and differential calculus methods in interpreting material using reasoned arguments and also in interpreting and setting up textbook-level problems.
    - explain and manipulate equations and techniques developed in the text, lectures, problem examples, and in the course of working problems.
    - apply the skills above to successfully solve textbook-level problems with numeric, symbolic, or conceptual answers.
    - critically evaluate the soundness and precision of your own answers, explain and interpret your solutions to problems in a way that shows understanding, and identify and appraise the range of applicability of your results, and their limitations.

Final Letter Grades will be based on a **term average** for the semester's work that includes the common exam scores, the final exam, and the term's homework score. Here are the approximate weights to be used for calculating the term average:

- **40%** for the two partial exams (20% each)
- **35%** for the final exam
- **25%** for the total of homework plus class participation measures. Homework will be worth about **12% to 16%,** at instructor's discretion. **C**lass participation may be worth **9%** to **13%.**

Extra credit may be given for optional exam problems, for active class participation, etc. Negative credit may be given for being late, leaving early, creating noise or otherwise interfering with the work of the class.

The term average values used as cutoffs for various letter grades will be approximately:

- **85% for A, 75% for B+, 65% for B, 56% for C+, 50% for C, and D or F below 50%.**

Examinations: There will be two partial Exams plus a comprehensive Final Exam. The schedule is:

- **Exam 1**: Tuesday, July 14 2:00 PM – 3:00 PM
- **Exam 2:** Thursday, July 23 2:00 PM – 3:00 PM
- **Comprehensive Final Exam** August 3 12:30 PM – 3:00 PM

There will be no make-up exams.

Students who miss an exam usually receive a score of zero for that exam. Students who miss two exams automatically fail the course unless they are excused. Students who expect to be absent from an exam should discuss their situation with their instructor PRIOR TO their absence. In order to qualify for a (rare) "make-up" exam a student needs to document the reason for not being able to take the test as scheduled. Under NJIT standard policy, the documentation should be presented to the student's Physics 121 instructor AND to the Dean of Students - (973) 596-3466, 2nd floor Campbell Entry. BOTH the Physics 121 instructor and the Dean of Students must concur in permitting a "make-up" exam. Students who miss exams and do not contact and present documentation to their instructors within 7 days of the exam will receive a score of zero for that common exam

Attendance will be taken at all classes and exams. More than 3 unexcused absences (in total) are excessive. If you have excusable absences contact your instructor or the Dean of Students.

Withdrawal: If you must withdraw from the course, do it officially through the Registrar before the last withdrawal date. If you simply stop attending and taking exams your instructor will have no option other than to assign a course grade of "F".

Help: The Physics Dept. may provide drop-in tutoring on a schedule to be posted. More information will be available from your instructor or the Physics Department office on the 4th floor of Tiernan after the term starts. Physics tutoring is also available through the CAPE and Learning Communities organizations. If you are having trouble in this course visit or email your instructor; do not simply hope for a miracle and fall further behind.

Honor Code Violations or Disruptive Behavior: NJIT has a zero-tolerance policy for cheating of any kind and for disruptive student behavior. Violations will be reported to the Dean of Students. The penalties range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT. Avoid situations where your own behavior could be misinterpreted as dishonorable.

- **Students are required to agree to the NJIT Honor Code on each exam.**

Turn off all smart and cellular phones, wireless devices, and messaging devices of all kinds during classes and exams. Please do not eat, drink, or create noise in class that interferes with the work of other students or instructors.

The schedule on page 4 lists the topics covered, text readings, and homework assignments throughout the term. Some of the information may be tailored to your own class's schedule. Do the homework problems: it is almost impossible to succeed in physics courses without working a lot of problems.

Each work unit begins with a lecture and includes a related homework assignment and perhaps some (optional) tutorials. These are usually covered in recitation class and are due about few days later.

- Read the assigned sections of the text before the lecture covering that material.
- Read the instructor's lecture notes before class (if provided) and bring them to class.
- Submit weekly homework assignments before they are due. The online system shows the most applicable due dates.
- Tutorial assignments will not be counted in your homework term score – they are just for learning.
- **Students who do not submit homework are automatically lowering their average by 12%** to **16%.**

Page 5 lists the preliminary homework assignment starting dates and due dates for Section 450.

Specific information for the Mastering Physics homework system: You will have to create an account on the MP system if you do not have one already. You can not sign up for the course your instructor sets up on MP until you have a valid Mastering Physics access code. So acquire one early and contact your instructor if this is a problem. Your instructor will announce a Mastering Physics course identifier for you to use when enrolling in your specific class. Use your NJIT email address as the logon ID for your account.

- The Mastering Physics login is **https://www.pearson.com/mastering** Click on "Student" in the upper left of the box. Respond "yes" that you have an access code (create an account if you do not already have one). Input your name exactly as it appears on NJIT's records: last name first, followed by a comma and your first and possibly middle name. Likewise, enter your 8 digit NJIT ID where indicated. For your own reference, record the unique course number announced by your instructor, and your Login ID and Password.
- Instructors cannot access forgotten logins or passwords.

Physics 121 Syllabus for Summer 2020
with Assignments Schedule for Section 450

Lecture Classes and Topics	Text (Y&F) Readings	Assignments & Recitation Topics (exact due dates to be announced)
Tuesday, June 30 Lecture 01: Vectors, Intro to Fields	Instr. Notes	Recitation: HW01 Begin HW01
Wednesday, July 01 Lecture 02: Electric Charge & Force	Sec. 21.1 - 3	Recitation: HW02 Begin HW02
Thursday, July 02 Lecture 03: Electric Field	Sec. 21.4 - 7	Recitation: HW03 Begin HW03
Tuesday, July 07 Lecture 04: Gauss' Law	Sec. 22.1 – 5	Recitation: HW04. Begin HW04
Wednesday, July 08 Lecture 05: Electric Potential	Sec. 23.1 - 5	Recitation: HW05. Begin HW05
Thursday, July 09 Lecture 06: Capacitance	Sec. 24.1– 6	Recitation: HW06. Begin HW06
Exam 1, July 14 Tuesday, 2:00 PM-3:00 PM		Covers Lectures & HW 01, 02, 03, 04, 05: Vectors & Fields + Ch 21, 22.1-5, 23.1-5
Tuesday, July 14 Lecture 07: Current, Resistance, DC Circuits, Intro to Kirchhoff's Rules	Sec. 25.1 - 5, Sec. 26.1 - 2	Recitation: HW07. Begin HW07
Wednesday, July 15 Lecture 08: Multi-loop and RC Circuits	Sec. 26.2 - 5	Recitation: HW08. Begin HW08
Thursday, July 16 Lecture 09: Charges & Currents in Magnetic Fields	Sec. 27.1 - 8	Recitation: HW09 Begin HW09
Tuesday, July 21 Lecture 10: Sources of Magnetic Field. The Biot-Savart Law, Amperes Law	Sec. 28.1- 7	Recitation: HW10 Begin HW10
Wednesday, July 22 Lecture 11: Faraday's Law of Induction	Sec. 29.1 - 5	Recitation: HW11 Begin HW11
Exam 2: July 23 Thursday, 2:00 PM– 3:00 PM		Covers Lectures & HW 06, 07, 08, 09 Chapters 24.1-6, 25.1-5, 26.1-5, 27
Thursday, July 23 Lecture 12: Inductance, RL Circuits	Sec. 30.1 – 4	Recitation: HW12 Begin HW12
Tuesday, July 28 Lecture 13: LC & LCR Circuits, EM Oscillations, AC Circuits	Sec. 30.5 - 6 Sec. 31.1 – 2	Recitation: HW13 Begin HW13
Wednesday, July 29 Lecture 14: AC Circuits, Resonance	Sec. 31.3 - 6	Recitation: HW14 Begin HW14
Thursday, July 30 Last Class		Review for Final Exam
Final Exam: August 03: 12:30PM-3:00PM		Comprehensive final exam: Chapters 21 - 31

Physics 121 Summer 2020 – Section 450

Preliminary Mastering Physics Homework Due Dates –

- **Assignments become available to students at 08:00 AM on corresponding lecture days.**
- **Submission deadlines are usually 3 days after a HW assignment is covered in recitation class.**

Section 450

Homework Assignment	Date Posted	Date Covered in Recitation Class	Date Due @ 11:59 PM
HW01	6/30/20	6/30/20	7/3/20
HW02	7/1/20	7/1/20	7/5/20
HW03	7/2/20	7/2/20	7/5/20
HW04	7/7/20	7/7/20	7/10/20
HW05	7/8/20	7/8/20	7/11/20
HW06	7/9/20	7/9/20	7/12/20
HW07	7/14/20	7/14/20	7/17/20
HW08	7/15/20	7/15/20	7/18/20
HW09	7/16/20	7/16/20	7/19/20
HW10	7/21/20	7/21/20	7/24/20
HW11	7/22/20	7/22/20	7/25/20
HW12	7/23/20	7/23/20	7/26/20
HW13	7/28/20	7/28/20	7/31/20
HW14	7/29/20	7/29/20	8/1/20