PHY 232
General University Physics II

Instructor: Professor Kwok-Wai Ng
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Office hours: Tuesday and Friday
11:30 AM to 12:30 PM

Course Description:

A general course covering electricity, magnetism, electromagnetic waves and physical optics. Lecture, three hours; recitation, one hour per week

Prerequisites:
PHY 231

Corequisites:
MA213

Meeting time and place:

Time: MTWRF 10:20-11:20
Place: Chemistry-Physics (CP) Building Rm 153

Course Webpage:

You can access your grade at your Canvas account. Other technical materials can be found at the course webpage
http://www.pa.uky.edu/~kwng/summer2016

Student Learning Outcomes:

After completing this course, the student will be able to:

1. Understand different electromagnetic phenomena, both qualitatively and quantitatively.
2. Describe Maxwell's equations and use it to explain the origin of electromagnetic radiation.
3. Use mathematics, including calculus, to solve physics and engineering problems in electricity and magnetism.

Course objectives:

Of the four fundamental forces in nature, besides gravitational force, electromagnetic force is the most common type of force that we can experience and play with in our daily life. Electromagnetic interaction at the atomic scale gives rise to all different kind of forces we have already learned in PHY231 – friction, restoring force (Hooke's Law) etc. It governs every chemical reaction occurring in laboratory or nature. Exactly because of its common occurrence,

we learn how to make use of it to the fullest extent. Basically every invention in modern technology involves some kind of electromagnetic phenomena.

So, we are now at the point to study this important force, and we devote one semester to do this. We will learn the interaction between stationary charges, moving charges, and finally the origin and properties of electromagnetic waves.

Required Materials:

1. Physics for Scientists and Engineers by Serway and Jewett, 9th Edition. Publisher: Cengage Learning.
2. Expert TA student account (for online homework)

Description of Course Activities and Assignments

1. Lecture

You should attend every lecture Monday, Tuesday, Wednesday, Thursday, and Friday 10:20 to 11:20 in CP153. New concept will be introduced and discussed in every lecture. There will be several short questions scattered in the lecture for you to answer by using your clicker. These questions may test what you remember from the previous lectures, or how much you understand on the materials we are discussing. You will work on the question on your own first, and you will have the opportunity to discuss with your classmates before clicking in your final answer. While no attendance will be taken, you may start to lose clicker points if you miss too many lectures. The intention of these clicker questions is not in taking class attendance, nor tests your knowledge in the subject. Instead, this is a device to stimulate class participation, and I will also use the result to gauge the pace of the class.

2. Recitation

Meeting time and place for recitation:

Section 020	T, R 8:00-9:00 CP183	Instructor:	Animik Ghosh
		Email:	animik.ghosh@uky.edu

In the recitation, the recitation instructor will help you in problems from the homework set that will be due Tuesday (for Tuesday recitation) and Friday (for Thursday recitation) near midnight at 11:59pm.

Course Assignments

Two one-hour tests at 150 points each
One one-hour final examination at 150 points
Homework at 150 points total for the whole semester
Recitation quizzes at 60 points for the whole semester
Class work at 40 points total for the whole semester

Total number of possible points: 700 points
This will be scaled proportionally to 100% in determining the final course grade.

Summary Description of Course Assignments

1. Tests

There will be two one-hour test during the semester. In each test, there are 12 short questions (multiple choice, fill in the blanks, true or false etc.) and one open response problem. No partial credits will be given for the short questions. For the open response problem, detail solutions are required for partial credits. To encourage students in attempting homework on their own efforts, some questions and problems in the tests are similar to the ones in the homework.

In case if you have an excused absence, you should bring appropriate verification to the instructor as early as possible. If you miss a test with a valid excuse, you have the option of either doing a makeup test, or receive a score based on the average of your other two tests and the final examination in proportional to that of the whole class. If you miss two or more tests, or the final examination, you will receive an incomplete (I) grade and you have to complete the tests or final examination in the next semester.

The tests will primarily cover the material presented since the previous exam. All of the exams will be closed-book, closed-note, and no formula sheet will be provided. It is your responsibility to identify the most important formula to remember and learn how to use them effectively in solving problems. You can use a scientific calculator, but you cannot use the programming function of the calculator. Except the calculator, all electronic devices, including cell phones, laptop computers, clickers etc., have to be turned off during the tests and examination.

2. Final examination

The one-hour final exam will be comprehensive. It has the same number of questions and problems as the one-hour tests. If you miss the final exam with an excused absence, you will receive an incomplete (I) grade.

3. Homework

Homework will be administered and submitted via TA Expert. To enroll in WebAssign, you will need to:
(1) Go to: https://www.theexpertta.com/registration
(2) Use Class Code USH19KY-4D67F8-1DK then continue the registration.
(3) The cost will be $27.50

You will be permitted 10 (ten) attempts at each individual problem. Late homework will not be accepted, and there will be no make-up homework assignments.

There will be two homework assignments for every week, one due 11:59pm on Tuesday and the other due 11:59 pm on Friday. The recitation class will discuss problems to be due. You should have about three days to complete a homework set. The homework sets may carry different points, but they will be normalized to 10 points each at the end of the semester. In other words, all homework sets have equal weight, independent of the level of difficulty and the number of problems assigned.

4. Recitation

There will be a short (five to ten minutes) quiz in each recitation class. Since the homework is mostly in multiple choice style, the purpose of the quiz is to practice in expressing your idea and writing solution. This will bridge the gap between homework and the open response problems in the tests and the final examination.

There will be no make-up Recitation Quizzes. However, two of your lowest recitation scores will be dropped at the end of the semester and this will effectively allow you to miss two recitation quizzes with no penalty to your final grade. Of course, attending all of the recitations will make it more likely that you will earn the maximum possible points for recitation quizzes.

5. Class work

I will give you some simple problems to solve at the end of each lecture, mostly for you to practice the materials you have just learnt in the class. Classwork will only be graded briefly, and the score only serves to encourage you to participate and attempt. This will also provide a feedback to me in knowing how well you understand the materials. Each class work will be worth 10 points. The lowest three scores will be dropped in the tabulation of the final grades, so there will be no make-up for the class work.

Course Grading

Grading scale for undergraduates:

92 % or above	A
80% or above	B
60% or above	C
50% or above	D
Below 50 %	E

The actual curve at the end of the semester may be adjusted according to the class performance and it may be slightly easier than the above letter grade assignment.

Final Exam Information

Thursday, August 4th 10:20-11:20 in CP153.
If there is any discrepancy, please follow the latest announcement from the University.

Course Policies:

Submission of Assignments:

Homework will be administered and submitted via ExpertTA. You need to have an account before you can receive and submit homework. Homework will be assigned every Tuesday and Friday. It will cover the materials of the last two or three lectures before the assignment. You will have about three days to complete the homework, and it is due near midnight (11:59pm) the next Friday and Tuesday.

Attendance Policy – Send around for more input.

We do not take attendance in lectures and recitations. However, if you miss too many classes, you will lose points in clicker questions and recitation quizzes.

Excused Absences:

Students need to notify the professor of absences prior to tests and the final examination when possible. S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit "reasonable cause for nonattendance" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (859-257-2754).

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused or unexcused) per university policy.

Verification of Absences

Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request "appropriate verification" when students claim an excused absence because of illness or death in the family. Appropriate notification of absences due to university-related trips is required.

Academic Integrity:

Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic

offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct and may result in permanent dismissal. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: http://www.uky.edu/Ombud. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of Student Rights and Responsibilities (available online http://www.uky.edu/StudentAffairs/Code/part2.html) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

Accommodations due to disability:

If you have a documented disability that requires academic accommodations, please see me as soon as possible after class or during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

Tentative Course Schedule

Class #	Date	Topics – formula review	Textbook reading
1	June 9 (R)	Charges and Coulomb's Law	23.1-23.3
2	June 10 (F)	Electric Field	23.4-23.6
3	June 13 (M)	Electric Flux and Gauss's Law	24.1-24.2
4	June 14 (T)	Application of Gauss's Law. Conductors in electrostatic equilibrium	24.3-24.4
5	June 15 (W)	More electrostatic problems and motion of a charged particles in an electric field	23.7
6	June 16 (R)	Electric potential and potential energy	25.1-25.4
7	June 17 (F)	Calculation of electric potential	25.5-25.6
8	June 20 (M)	Capacitance	26.1-26.2
9	June 21 (T)	Combinations of capacitors and energy stored in a charged capacitor	26.3-26.4
10	June 22 (W)	Electric dipole and dielectrics	26.5-26.7
11	June 23 (R)	Electric current and resistance	Chapter 27
12	June 24 (F)	Test 1	Chapters 23-27
13	June 27 (M)	Electromotive force, resistors in series and parallel	28.1-28.2
14	June 28 (T)	Kirchoff's rule	28.3
15	June 29 (W)	RC circuits	28.4
16	June 30 (R)	Magnetic field, magnetic force on a moving charged particle	29.1-29.3
	July 1 (F)	Magnetic force acting on a current	29.4
17	July 4 (M)	Independence Day – academic holiday	
18	July 5 (T)	Torque on a current loop	29.5
19	July 6 (W)	Midterm. Hall effect	29.6
20	July 7 (R)	Biot –Savart Law	30.1
21	July 8 (F)	Ampere's Law and magnetic force between two parallel conductors	30.2-30.3
22	July 11 (M)	Solenoid	30.4
23	July 12 (T)	Gauss's law in magnetism and magnetism in matter	30.5-30.6
24	July 13 (W)	Faraday's law of induction	31.1
25	July 14 (R)	Motion emf and Lenz's law	31.2-31.3
26	July 15 (F)	Test 2	Chapter 28-30
27	July 18 (M)	Induced emf and electric fields	31.4
28	July 19 (T)	Generators and motors, Eddy current	31.5-31.6
29	July 20 (W)	Self-inductance and inductance. RL circuit	32.1-32.2
30	July 21 (R)	Energy in a magnetic field. Mutual inductance	32.3-32.4
31	July 22 (F)	LC and RLC circuits	32.5-32.6
32	July 25 (M)	AC sources and resistors in an AC circuit	33.1-33.2
33	July 26 (T)	Inductors and capacitors in an AC circuit	332.3-33.4

34	July 27 (W)	RLC series circuit	33.5, 33.7
35	July 28 (R)	Power in an AC circuit	33.6
36	July 29 (F)	Transformer, rectifiers and filters. Household wiring and electrical safety	33.8-33.9, 28.5
37	Aug 1 (M)	Displacement current and Maxwell's equations	34.1-34.2
38	Aug 2 (T)	Electromagnetic waves	34.3-34.5
39	Aug 3 (W)	Spectrum of electromagnetic waves	34.6-34.7

Final examination: Thursday, August 4th at 10:20am in CP153. (If there is any discrepancy, please follow the latest announcement from the University.)