

Harry S Truman College
One of the City Colleges of Chicago

COURSE SYLLABUS
Spring 2014

Course Title and Section: Physics 236 PQR

Credit Hours: 5

Contact Hours: 8

Class Meeting Times: MW 5:45 – 9:25 pm, Room: 3833, main building

INSTRUCTOR: Dr. Kai Cai

E-MAIL: kcai@ccc.edu

PHONE: 773-907-4347

OFFICE: Main building 3834

OFFICE HOURS: Mon & Wed 3:30 – 5:35pm, Thu 3:30 – 5:30pm, and by appointment via email

COURSE WEBSITE: ccc.blackboard.com

Course Description: Engineering Physics II: Electricity & Magnetism

Exploration of electricity and magnetism as they relate to fields, forces and energy using calculus to analyze theoretical and practical problems in lecture and laboratory. Writing assignments, as appropriate to the discipline, are part of the course. **Prerequisites:** Grade of C or better in Math 207 and in Physics 235, and eligibility for English 101 or Consent of Department Chairperson.

This Course is Expected to Serve: students majoring in physical sciences or engineering who have already taken calculus and learned mechanics (calculus-based) in Physics 235, and for those continuing in science programs at four-year institutions.

Textbooks and Materials:

Text: *Fundamentals of Physics* by Halliday, Resnick, and Walker (9th edition), published by John Wiley & Sons, ISBN: 978-0-470-46908-8; Binder-ready version ISBN: 978-0-470-56473-8

Student Companion Site:

<http://bcs.wiley.com/he-bcs/Books?action=index&itemId=0470469080&bcsId=5586>

Supplementary Textbooks (not required):

1. (*Sears & Zemansky's*) *University Physics* by Young & Freedman, 12th (or latest) edition
2. *College Physics*, 8th (or latest) edition by Serway & Vuille

Other materials:

A computer with internet access is needed to check course Blackboard site and finish assignments. Students without home internet access may use free WiFi and computers with internet access at Truman, other CCC campuses and all Chicago Public Libraries.

A scientific calculator (with complex functions such as e^x , log, and sin) and a notebook are also needed.

Recommended videos: see Blackboard: External Links

Course Objectives:

1. To provide student with a basic understanding of electricity, magnetism, electromagnetic induction, alternating current circuits, and electromagnetic waves.
2. To develop a basic understanding of household circuits, electric grid, and other everyday applications of electromagnetism.
3. To explore applications of the above concepts in a laboratory.
4. To apply habits and skills of scientific thought to personal and social problems.
5. To stimulate the student to further interest in physics and other related fields.

General Education Objectives:

A student who successfully completes the course will demonstrate competence in four areas:

1. Knowledge of course content;
2. Critical thinking;
3. Writing; and
4. The use of technology as a learning resource

Student Learning Outcomes:

Upon satisfactory completion of the course, students will be able to:

1. Determine the electric field due to an array of charges.
2. Calculate electric flux and electric potential due to an array of charges.
3. Evaluate the capacitance of a charge distribution.
4. Evaluate materials using the concepts of conductance, resistivity and current density.
5. Analyze DC circuits (series and parallel) using Ohms Law and Kirchhoff's Laws for circuits.
6. Calculate trajectories of charged particles in magnetic fields.

7. Calculate the magnetic field due to an array of currents using the Bio-Savart Law.
8. Calculate the EMF generated by a changing magnetic flux using Amperes Law,
9. Evaluate mutual and self inductance.
10. Evaluate systems by applying Maxwell's equations of electrodynamics.
11. Calculate the impedance of AC circuits and the behavior of inductors, capacitors and resistors.
12. Determine the phase constant of an AC circuit using and oscilloscope.
13. Determine the power per area of electromagnetic waves using the Poynting Vector.
14. Perform experiments in electricity and magnetism and apply techniques of error analysis in analyzing the results.
15. Summarize coherently the results of an experiment in a written report.
16. Apply the principles of electromagnetic theory to explain events in the real world.

Method of Instruction: Lectures, problem-solving sessions, demonstrations, video presentations, collaborative learning activities. Writing is incorporated in the form of lab reports.

Grade breakdown:

Homework: 160 points (approximately 19.5%)

Labs & reports: 140 points (17%)

Quizzes: 100 points (12%)

Class participation: in-class exercises, group discussions and presentations, class attendance, etc.: 100 points (12%)

Midterm exams: 200 points (24%)

Final exam: 120 points (14.6%)

Note: 1) the percentages are approximate.

2) there may be small adjustments.

Your final grade will be determined according to the following scale:

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|---|-------------|
| A | 87% -100% |
| B | 77% - 86.9% |
| C | 65% - 76.9% |
| D | 55% - 64.9% |
| F | < 55% |

Definition / Statement of Active Pursuit of the Course:

District and College attendance policies are listed in the college catalog and the Student Policy Manual: <http://www.ccc.edu/departments/Documents/studentpolicymanual.pdf>

At midterm all professors must submit a grade that reflects the performance of each student. Students will be dropped from the class for lack of active participation for any of the following reasons:

- 1) 50% of lectures

- 2) 50% of homework
- 3) 50% of quizzes and exercises
- 4) 50% of Tests

A student who is not actively participating in any one of the items listed above can be dropped at the midterm and receive a grade of ADW (Administrative Withdrawal).

“No Show” Policy: If a student registered for the course before the start time of the first class period, but 1) did not attend the first 2 classes, or 2) attended only 1 of the first 3 classes and failed to notify the instructor of his or her intentions to continue the class, the Registrar’s Office will remove the student from the course.

Lectures:

It is important that you attend all lectures. Some lectures may include extra materials which may appear in exams. To avoid disruptions, students are expected to arrive on time and to remain in class for the entire duration, and actively participate in the class activities. If you are late, sit near the door quietly and come to the podium only during the break. Students are expected to read the assigned/relevant topics on the textbook *before* each session and take careful notes in the lectures. Cell phones or similar electric devices should not ring or make noise anytime while class is in session. Side conversations are prohibited. Students who impede the learning of others may be asked to leave for the remainder of the lecture or laboratory and may be subject to disciplinary action.



Homework Assignments:

It is important that you do assigned reading each week, monitor the course Blackboard site for announcements and view the assigned videos. Most homework will be assigned weekly, and to be submitted online at <http://www.webassign.net> by the following week. (If you cannot afford to purchase the access to the website, you can submit your homework on Blackboard or on paper, but the tradeoff is that only selected problems will be graded, and it may be a while to have the graded homework returned to you.) The exact due date for each of the homework will be announced in class when assigned and posted on the WebAssign website. Late work will receive only partial credit (typically you lose 10% each day after the deadline). In general, the instructor will not offer any assistance with late homework assignments. A waiver of the late penalty given extenuating circumstances will be considered on a case-by-case basis provided appropriate documentation.

WebAssign class key: **wilburwright 6229 6537**

Laboratory:

All students are required to perform about nine lab experiments. Each experiment will be performed by groups of two or three students, but lab reports are required to be submitted

individually. Details will be provided for each lab experiment. The lab reports are generally due in one week from the date of the experiment (unless otherwise noticed). Students are expected to preview the lab setup (if available) before each lab session. Due to equipment availability issues, NO make-up labs will be given.

Quizzes:

There will be announced and unannounced quizzes approximately once a week, except for the weeks of midterm and final. A grade of zero will be entered for a missed quiz. NO make-up quiz will be given. At the end of the semester, the lowest quiz score may be dropped.

Exams:

There will be two midterm exams (100 points each) and one comprehensive final exam (120 points). All exams will be given in the classroom during class time. Make-up exams will be given only under extreme circumstances and solely at the discretion of the instructor. **During exams, students may not be allowed to use a graphing calculator or a cell phone as the calculator. Sharing of a calculator during an exam is also prohibited.**

Blackboard discussions:

Each student is expected to post at least one Blackboard discussion post by the end of the semester, which will be counted as a part of your class participation (see **Grade breakdown** on page 3).

Attendance and make-up policy:

Each student must sign the attendance sheet at each class. If a student misses a class due to illness or family reasons or religious observances etc., it is the student's responsibility to notify the instructor ahead of time, if possible. The student may be requested to provide valid written documentation. Note absence does not excuse a student from completing the course homework (and other applicable assignments, such as lab reports). If a student misses a class he or she should do the following: a) check announcements on Blackboard, b) read through the materials covered in the missed class, and c) attempt to do the homework problems or other applicable assignments. Students are responsible for all missed announcements and class work. Any make-up activity will only be arranged *after* exhausting all the drop options (see above). If a student misses over half of the classes before midterm, he or she will be dropped with an ADW at midterm (see page 4). At the end of the semester, attendance record may be counted as a part of the participation points and accounts for no more than 5% of the overall grade. If you wish to withdraw from the class, it is your responsibility to do so officially by **April 7**. After the midterm, if you simply quit coming to class without dropping the course, you will receive a grade of F and lose your tuition.

Last day for student-initiated withdraw: April 7, 2014

Academic integrity: The City Colleges of Chicago is committed to the ideals of truth and honesty. In view of this, students are expected to adhere to high standards of honesty in their

academic endeavor. Plagiarism and cheating of any kind are serious violations of these standards and will result, minimally, in the grade of “F” by the instructor.

Student Conduct: City Colleges of Chicago students are expected to conduct themselves in a manner which is considerate of the rights of others and which will not impair the educational mission of the College. Misconduct for which students are subject to College Discipline (e.g. expulsion) may include the following: (1) all forms of dishonesty such as stealing, forgery, (2) obstruction or disruption of teaching, research, administration, disciplinary proceeding, (3) physical or verbal abuse, threats, intimidation, harassment, and/or other conduct that threatens or endangers the health or safety of any person, and (4) carrying or possession of weapons, ammunition or other explosives.

Compliance with the Americans with Disabilities Act (ADA): It is the policy of the school to make reasonable accommodations for qualified students with disabilities, in accordance with the Americans with Disabilities Act (ADA). If you need accommodations to complete your course requirements, you must notify the Disability Access Center (more information below) in Student Services. You should also notify me within the first two weeks of class.

Topical Outline (subject to adjustments):

Weeks/Dates	Schedule	Laboratory session
Week 1 (January 13, 15)	Chapter 21-22	Lab 1: Electrostatics
Week 2 (January 22)	No class on Jan 20; Chapter 22	
Week 3 (January 29)	Chapter 22	
Week 4 (February 3, 5)	Chapter 23 (Gauss' Law)	
Week 5 (February 10,12)	Chapter 24 (Electric Potential); Chapter 25 (Capacitance)	Lab 2: Electric Field
Week 6 (February 19)	No class on Feb 17; Exam 1 on February 19	
Week 7 (February 24, 26)	Chapter 25 (Capacitance); Chapter 26	Lab 3: Ohm's Law
Week 8 (March 3, 5)	Chapter 26-27	
Week 9 (March 10, 12)	Chapter 27 (Circuits)	Lab 4: DC Circuits
Week 10 (March 17, 19)	Chapter 28 (Magnetic Fields)	Lab 5: Wheatstone bridge
Week 11 (March 24, 26)	Chapter 28; Midterm Exam 2	Lab 6: RC Circuits
Week 12 (March 31, April 2)	Chapter 29	Lab 7: Magnetic Field
Week 13 (April 7, 9)	Chapter 30	Lab 8: Electromagnetic Induction
Week 14 (April 14 - 18)	Spring Break (no class)	
Week 15 (April 21, 23)	Chapter 30, 31	Lab 9: Oscilloscope
Week 16 (April 28, 30)	Chapter 32, Chapter 33 (up to §33-5)	
May 5, 7	Review & Final Exam	

Academic Support Services:

Numerous academic support services are available to students of Truman College.

Tutoring Center - for students who need help with their assignments: Room 177, McKeon Building, 773-907-4785, <http://www.ccc.edu/colleges/truman/departments/Pages/Tutoring.aspx>

Writing Center - offers free writing assistance to Truman students enrolled in any credit course. Writing consultants, who are also professors at the college, provide feedback and instruction on any stage of the writing process in any class subject. Students can visit the Center to make half-hour or one-hour appointments with writing consultants for tutoring sessions on essays or other writing assignments, as well as placement test preparation, and writing workshops on various topics. The Writing Center is located in Room 1435 of the main building and is open Monday-Thursday from 9am to 7pm and Friday-Saturday from 11am to 2pm. 773-907-4387.

Math Center – Room 1220, main building. Offers group math workshops etc. 773-907-6832.

Student Success and Leadership Institute (SSLI) - for students who need various other support services to achieve their educational goals: Room 1435, 773-907-4714.

TRIO Student Support Services: for low-income students, first generation college students, or students with disabilities who need academic support: Room 1435, 773-907-4784, <http://www.ccc.edu/colleges/truman/departments/Pages/TRiO-Student-Support-Services.aspx>. Registration is required at the start of each semester.

Disability Access Center: the Center verifies needs pursuant to the American Disabilities Act (ADA), determines student academic accommodations, and issues accommodation letters. Registration is required at the start of each semester. Room 1435, main building. 773-907-4725. <http://www.ccc.edu/colleges/truman/departments/Pages/Disability-Access-Center.aspx>

Transfer Center: 773-907-4724; Room 1435, main building.

FERPA

FERPA (Family Educational Rights and Privacy Act) is a federal law that protects the privacy of student educational records. Faculty cannot reveal information about students, or discuss student records over the phone or unsecure e-mail. CCC student e-mail meets FERPA requirements. See: www.ed.gov/policy/gen/guid/fpco/ferpa/index.html.

Please note: the instructor reserves the right to change this syllabus at any time.

Truman College General Education Goals

The student exhibits social and ethical responsibility and is aware of her or his place in the global community.

The student performs effectively in the workplace and has the ability to work and make effective use of a wide variety of current technologies.

The student communicates effectively in both written and oral formats.

The student demonstrates the ability to think critically, abstractly, and logically.

The student gathers, interprets and analyzes data.

The student demonstrates the ability to work independently.