

**WRIGHT COLLEGE**  
**One of the City Colleges of Chicago**

**COURSE SYLLABUS**  
**Spring Semester 2021**

**Course Title and Section:** Physics 236 OQS and XOQS. IAI # PHYS 912

**Length of Course:** One academic semester

**Credit Hours:** 5 unit of credits

**Contact Hours:** 8 hours.

**Class Meeting Times:** M, W: 6:00 pm – 9:40 pm and 6:00 pm – 9:20 pm W. Building / Remote Learning

**Instructor:** Jeff Schmitz

**E-MAIL:** jschmitz@ccc.edu

**OFFICE:** Virtual

**OFFICE HOURS:** M, W 2:00 PM TO 3:00 PM

**COURSE WEBSITE :** ccc.brightspace.com

**Course Description:** Emphasizes problem solving involving the use of calculus. Primarily for students majoring in engineering or the physical sciences. IAI PHYS 912.

**Prerequisites:** Grade of C or better in Physics 235 and Math 207 or consent of Department Chairperson. It is strongly recommended that Math 208 be taken before Physics 236.

**Required Texts and Materials:**

**Text:** Physics for Scientists and Engineers with Modern Physics 10<sup>th</sup> edition by Serway & Jewett. ISBN: 978-1-337-55329-2

**Materials:** One binder, notebook for the homework assignments, and scientific calculator.

**Students Course is Expected to Serve:** Students majoring in science and engineering.

**Course Objectives:** The course will introduce the concepts of Electric and Magnetic fields and the effects of these fields on electric charges and the study, properties, and practical applications of direct current and alternative current circuits.

**Student Learning Outcomes:** Upon successful completion of this course, students will:

- 1) Be able to demonstrate understanding of the basic concepts of physics in the subject areas: Electromagnetism theory and applications.
- 2) Be able to analyze and interpret graphs. Also will make conclusions and prediction of the physical variables of the graphs.
- 3) Students will demonstrate the ability to solve problems, to work independently and to work as members of a team.
- 4) Students should be able to design and set up an experiment, collect and analyze data, identify sources of error, and interpret their result and connect it to related areas of physics.

**Specific learning outcomes:**

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

1. Determine the force among electric charges applying Coulomb's law.
2. Determine the electric field due to an array of point and continuous distribution charges
3. Determine the Electric Field due to an array of charges using Gauss's Law.
4. Determine the electric Potential due to an array of point and continuous distribution of charges.
5. Evaluate the capacitance of a charge distribution.
6. Determine the equivalent capacitance of capacitors combined in series and parallel.
7. Evaluate materials using the concepts of conductance, resistivity and current density.
8. Analyze DC circuits (series and parallel) using Ohm's Law and Kirchhoff's Laws.
9. Calculate trajectories of charged particles in magnetic fields.
10. Calculate the magnetic Field due to an array of currents using the Bio-Savart Law.
11. Calculate the magnetic Field of long cylindrical current-carrying wire using Ampere's Law.
12. Calculate the EMF generated by a changing magnetic flux using Faraday's Law.
13. Evaluate mutual and self-inductance.
14. Calculate the impedance of AC circuits and the behavior of inductors, capacitors and resistors.
15. Determine the phase constant of an AC circuit using an oscilloscope.
16. Perform experiments in electricity and magnetism and apply techniques of error analysis in analyzing the results.
17. Summarize coherently the results of an experiment in a written report.
18. Apply the principles of electromagnetic theory to explain events in the real world.

**Method of Instruction:** The format will be a combination of direct instruction lecture style, followed by activities like cooperative learning. Also students will use the internet for doing virtual experiment

and Microsoft software for drawing, calculation and graphs. Special attention is given to laboratory sessions.

**Definition / Statement of Active Pursuit of the Course:**

Active pursuit of this course constitutes participation in:

1. 50% of lectures
2. 50% of homework
3. 50% of quizzes and exercises
4. 50% of Tests
5. 80% of laboratory experiments that must be completed.

Successful completion refers to submission of a report resulting from attendance and full participation in the corresponding laboratory experiment.

**A student who is not actively participating in any one of the items listed above can be dropped at the mid-term and receive a grade of ADW.**

**“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.

**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.**

**Disability Access Center:** Please note: Any student with a disability, including a temporary disability, who is eligible for reasonable accommodations should contact the Disability Access Center located in room L135, Learning Resource Center of the Wright North Campus or call (773) 481-8016 as soon as possible.

### **Grading:**

There are three 100-point exams. The exams will be posted for about a week. A missed exam counts as a zero.

Each quiz is worth five points.

Each lab is worth 20 points.

The final examination is a 200-point, comprehensive, test with you will take on-line with zoom on during class time on December 15. You must take the final exam to pass the course.

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

90 % ≤ A ≤ 100%

80 % ≤ B < 90 %

65 % ≤ C < 80%

55 % ≤ D < 65%

F < 55%

### **Department Final Exam Policy Statement:**

As part of a mandatory Physical Science & Engineering Department policy, students will be given a Department Final Exam on the last day of class at the time designated by the instructor within the section's regularly scheduled hours. Students that are absent for the Department Final Exam for their section will receive a zero for the exam

### **Remarks:**

- During exams or quizzes students are not allowed to use cellular phones.
- The students are responsible to bring their own calculator to the exams or quizzes.
- Each student will write an individual lab report. (No group report will be accepted)
- The students are responsible for checking their grades posted in Bright Space.

### **Late Work and Make-up Assignments:**

#### **Absentee Policy:**

**Homework due date:** Homework is due on **the date assigned in class**. After one week pass of the due date the homework will NOT be accepted.

**Last Day to withdraw from the course:** Nov. 20, 2021. After that day, no faculty or school administrator is allowed to sign late withdrawal forms.

### **Support Services:**

Wright College is committed to your success! Below you will find a list of offices you may wish to contact during the semester for assistance:

- Academic Support Center (Tutoring) Room A - 245
- Business Services Room A - 138
- Center for Academic Success (Advising & Transfer) Gateway, Room A - 120
- **Disability Access Center\*** Room L – 135; Phone: (773) 481-8015
- Engineering Center Support Floor, LRC 101
- Financial Aid Wright Stop, Room A - 128
- Math and Physics Emporium (STEM Tutoring) Room S - 102
- Wellness Center Room S - 106
- Writing Center (Writing Support for Assignments, Resumes, etc.) Room S - 101

*\*Any student with a disability (or temporary disability), who is eligible for reasonable accommodations, should contact the Disability Access Center as soon as possible*

It is recommended to use CamScanner for scanning and uploading the homework to Bright Space. CamScanner can be downloaded for free using your school email account.

<b>Spring Semester 2021 Physics 236-GIK</b>			
<b>Changes on the dates of Exams I, II, quizzes, could be make at the discretion of the instructor and will be announce in class. The days for virtual laboratory sessions will be announced in class</b>			
<b>Week</b>	<b>Date: Week of</b>	<b>Chapter Number</b>	<b>Homework Problems Textbook: Physics by Serway. 10<sup>th</sup> edition</b>
1	Aug 30	Ch. 22. Coulomb Law, Electric Fields due to point and continuous objects.	Ch 22: 7,10,11,17,19,21,24,32,33,41,43
2	Sept 6	Ch. 23. Gauss' Law. Electric Flux.	Ch 23: 3,8,11,12,14,16,18,27,29,33,34,37,41
3	Sept 13	Gauss's Law continue Instrumentation Laboratory	
4	Sept 20	Ch. 24. Electric Potential due to point and continuous distribution of charges	Ch 24: 8,12,15,21,22,25,27,35,45
5	Sept 27	Ch. 25 Capacitance and Dielectrics. Determine the equivalent capacitance	Ch 25: 1,3,10,11,12,13,15,17,18, 21,25,28  <u>Test one</u>
6	Oct. 4	Ch. 25. Continue, Review.	
7	Oct. 11	Ch. 26. Current and Resistance. Ohm's Law	Ch 26: 1,4,5,17,18,25,29,31,39
8	Oct.18	Ch. 27. Direct Current Circuits Kirchhoff Law's	Ch 27:13,17,20,21,23,24,27,33,34,36,41
9	Oct. 25	Ch. 28 Magnetic Fields. Force on a moving charge. Torque on a current loop.	<u>Test Two</u> Ch. 28: 4,5,7,13,20,21,24,25,28,33
10	Nov. 1	Ch. 29 Source of the Magnetic Field. Bio-Savart Law.	Ch. 29: 1,5,7,11,12,13,21,22,23,24,31
11	Nov. 8	Ch. 29 Ampere's Law	
12	Nov. 15	Ch. 30 Faraday's Law. Induced emf. Motional emf.	Ch 30: 1,15,23,25,30,35,40,44,45,
13	Nov. 22	Ch. 31 Inductance. RL circuits	<u>Test Three</u> CH 31: 2,3,10,11,12,20,33,
14	Nov. 29	Ch. 32 Alternating Current. AC sources. Phase and Phasors.	Ch 32: 1,7,9,12,13,16,19,20,21,23,26
15	Dec. 6	Ch. 32 Alternating Current The series RLC circuit. Power	<u>Quiz</u>
16	Dec. 13	Dept. Final Exam (Multiple choice-all chapters)	Dept. Final Exam on Wednesday