



PHY-211: Engineering Physics II

Course Title: Engineering Physics II      Course Number: PHY-211      Credits: 4

Pre-requisite(s)    PHY-111    and    MAT-111

Meeting Times: \_\_\_\_\_

Meeting Room: \_\_\_\_\_

Instructor: \_\_\_\_\_

Office Hours: \_\_\_\_\_      Office Location: \_

E-mail: \_\_\_\_\_      Telephone: \_

- B. **Course Description:** An introductory course in calculus-based mechanics. Provides an introduction to electricity and magnetism. The course starts with electrostatics gauss's laws, faradays Laws and culminates with all of Maxwell's equations.

**Students' Learning Outcomes/ Objectives (SLO)**

*Upon successful course completion students will be able to:*

1. Apply the scientific method to analyze problems regarding electricity and magnetism and report the outcome.
2. Explain the role of electricity, magnetism, and technology in society and daily life.
3. Demonstrate an understanding of the fundamentals of electrostatics, Coulomb's law, Gausses' law, and other electricity and magnetism laws to include:
  - o Explain how static electric and static magnetic fields arise.
  - o Analyze the concept of time-varying electric fields acting as sources of magnetic fields and vise/versa and apply these phenomena to specific cases

- Analyze and explain Maxwell's equations.
  - Analyze Kirchhoff's two laws and demonstrate how these laws apply in the circuits studied at the level of this course.
  - Discuss the concepts of resistance, capacitance and inductance from the field theory viewpoint, and their effect as elements in a circuit.
  - Apply calculus to real physical systems discussed.
4. Think critically about the science and practice of physics particularly electricity and magnetism
  5. Report laboratory findings clearly and with correct scientific terminology
    - a. Demonstrate competency in utilizing lab equipment
    - b. Construct circuits from schematics and measure voltage and current
    - c. Use the library and Internet to supplement the lab materials

## **Text: University Physics (15<sup>th</sup> edition) By Young and Freidman**

Background readings and other materials:

1. Fundamental of Physics Extended Halliday, David and Resnick, Robert.  
John Wiley and Sons.
2. Feynman, Character of Physical Law. Random
3. Douglas Giancarlo Physics for Scientists and Engineers.

## **Course Outline:**

**(Exams & Labs schedules are based on material covered in class)**

### **Week      Topics**

1.      Periodic Motion and waves
2.      Electric charge and Conductors, Insulators, induced Charges, and electric field  
          (SLO 1, 2, 3)
3.      Electric field and Electric Forces, Electric field lines, and electric dipoles
4.      Gauss's law Charges and Electric Flux and Flux Calculations & Applications
5.      Charges on Conductors (SLO 1, 2, 3, 5)
6.      Electric Potential and Equipotential Surfaces and Potential Gradient (SLO 1, 2, 3, 4)  
          **Exam #1**
7.      Capacitors and capacitance, capacitors in series and parallel (SLO 1, 2, 3, 5)
8.      Current, resistance, and Resistivity (SLO 1, 2, 3, 4, 5)  
          Ohm's Law Electromotive force, Energy and Power  
          **Exam #2**

- 9 Magnetism and magnetic field  
Magnetic Field Magnetic field lines and magnetic flux.  
Magnetic force and Torque on Current Carrying conductors (SLO 1, 2, 3, 4, 5)
- 10 Magnetic field of moving charge and magnetic fields of electric current  
Ampere's law and applications (SLO 1, 2, 3, 4, 5)
- 11 Induction Experiments, Faradays law and Lenz's law

**Exam #3**

- 12 Electromagnetic Induction and Maxwell's Equations and RLC Circuits (SLO 1, 2, 3, 4, 5)
- 13 Alternating Current: (SLO 1, 2, 3, 4, 5)
- 14 Light waves and EM wave motion (SLO 1, 2, 3, 4, 5)

**Final Exam**

Physics Lab (may adjust to material covered in class and available material)

Week:	PHY211
1	Lab Safety Periodic Motion and Standing Waves
2	Electrostatic charges and Electric Field
3	Capacitors in series and parallel
4	Simple DC Circuit and Ohm's law
5	Kirchhoff's laws
6	Magnetism and the magnetic field
7	Faraday's Law and Magnetic Induction Electric Generator
8	Light waves and absorption of light
9	Geometric optics (mirrors and lenses)

**Assessment**

- 1. Three in-class exams 20 % each
- 3. A final comprehensive exam 20%

FINAL AVERAGE	GRADE	FINAL AVERAGE	GRADE
92 – 100	A	75 – 77	C+
88 – 91	A–	70 – 74	C
85 – 87	B+	60 – 69	D
82 – 84	B	0 – 59	F
78 – 81	B–		

- ATTENDANCE POLICY:

Students may be dropped after 3 absences. Regular attendance is crucial to doing well in the course. All cell phones should be turned OFF. If a student expects an emergency call, clear it with me before class. If a cell phone rings during class, the student will be asked to leave for the remainder of the class. No food or drinks are to be used except bottled water. Students are expected to follow attendance guidelines as presented in the syllabus provided by the instructor. However, in case of an emergency or illness, students are advised to notify their instructor or counselor immediately. The instructor will determine the validity of the absence. The exceptions to instructor discretion exist when members of armed forces are called for training or assignment or any case where students are legally required to be elsewhere. Pending the submission of appropriate documentation reasonable accommodations for make-up work shall be provided, and in accordance with guidelines included in the syllabus.

- **ACCESSIBILITY SERVICES** STATEMENT:

Students with disabilities who believe that they might need accommodations in this class are encouraged to contact Counselor/Coordinator, and Disability Support Services at (201) 360-4157, as soon as possible to better ensure that such accommodations are implemented in a timely fashion. All disabilities must be documented by a qualified professional such as a Physician, Licensed Learning Disabilities Teacher Consultant (LDTC), Psychiatrist, Psychologist, Psychiatric Nurse, Licensed Social Worker, or Licensed Professional Counselor, who is qualified to assess the disability that the student claims to have and make recommendations on accommodations for the student. All information provided to the Disability Support Services Program will be confidential between the program, professors involved with the student, and individual students.

- ACADEMIC INTEGRITY STATEMENT:

Academic Integrity Standards

Academic integrity is central to the pursuit of education. For students at HCCC, this means maintaining the highest ethical standards in completing their academic work. In doing so, students earn college credits through their honest efforts. When they are awarded a certificate of degree, they have attained a goal representing genuine achievement and can reflect with pride on their accomplishment. This is what gives college education its essential value.

Violations of the principle of academic integrity include:

Cheating on exams

Reporting false research data or experimental results

Allowing other students to copy one's work to submit to instructors

Communicating the contents of an exam to other students who will be taking the same test

Submitting the same project in more than one course, without discussing this first with the instructor

Submitting plagiarized work. Plagiarism is the use of another writer's words or ideas without properly crediting that person. This unacknowledged use may be from published books or articles, the Internet, or another student's work

When students act dishonestly in meeting their course requirements, they lower the value of education for all students. Students who violate the college's policy on academic integrity are subject to failing grades on exams or projects, or for the entire course. In some cases, serious or repeated instances of academic integrity violations may warrant further disciplinary action.

#### Hudson County Community College Classroom Recording Policy

- Hudson County Community College prohibits the audio-visual recording, transmission, and distribution of classroom sessions. Classes may only be recorded with the advance written permission of the instructor. The Hudson County Community College classroom recording policy must be listed in all syllabi.
- All classroom recordings can only be used for academic purposes by students enrolled in that class. Recordings may not be shared, reproduced, or uploaded to public websites or other mediums, and these recordings may contain copyrighted material and are prohibited from any form of commercial use.
- All students and guests must be informed that the class may be recorded. Due to issues related to privacy and the possible inhibition of student participation, instructors should be mindful of the effects of permitting classroom recording.
- Instructors should retain electronic or paper copies of their written consent to grant classroom recordings.
- Students must destroy their recordings at the end of the semester.

- Students who are granted permission to record their class by the office of Disability Support Services should inform the instructor beforehand and are subject to the policies outlined in this document.
- Violation of this policy is subject to disciplinary action listed under the code of conduct as included in the Student Handbook. Instructor Classroom Recording Policy
- Instructors may record their classes as long as students are informed in writing in advance that recording will take place. Instructors may distribute their own lectures, but this must be limited to the lecture portion of the class. Recordings of student presentations or activities may be used in the class if the students are notified in advance of the recording. Recordings of student presentations or activities may not be distributed in any way without the advance written consent of the students. This should be included in all syllabi: Hudson County Community College prohibits the audio-visual recording, transmission, and distribution of classroom sessions. Classes may only be recorded with the advance written permission of the instructor. The complete classroom recording policy is listed in the student handbook.

Successful people access support from others when needed. Hudson County Community College has many supportive services available to help you meet your goals. You are encouraged to contact your instructors or other professionals on campus. Below are resources available to you.

**In case of Emergency, Please contact security or 911**

	<b>Journal Square Campus</b>	<b>North Hudson Campus</b>
<u><b>Counseling Services</b></u> <a href="mailto:counseling@hccc.edu">counseling@hccc.edu</a>	201-360-4150 A Building, Floor 2 <a href="https://myhudson.hccc.edu/advisement">https://myhudson.hccc.edu/advisement</a>	201-360-4150 Enrollment Center, Floor 1 <a href="https://myhudson.hccc.edu/advisement">https://myhudson.hccc.edu/advisement</a>
<b>The National Suicide Prevention Lifeline: 1-800-273-8255</b> <b>Crisis Text Line: Text HELLO to 741-741</b>		
<u><b>Advising Services</b></u> <a href="mailto:advising@live.hccc.edu">advising@live.hccc.edu</a>	201-360-4150 A Building, Floor 2 <a href="https://myhudson.hccc.edu/advisement">https://myhudson.hccc.edu/advisement</a>	201-360-4150 Enrollment Center, Floor 1 <a href="https://myhudson.hccc.edu/advisement">https://myhudson.hccc.edu/advisement</a>
<u><b>Career Development</b></u> <a href="mailto:career@hccc.edu">career@hccc.edu</a>	201-360-4181 A Building, Floor 3 <a href="https://myhudson.hccc.edu/career-development">https://myhudson.hccc.edu/career-development</a>	201-360-4181 Floor 2, Room 204 <a href="https://myhudson.hccc.edu/career-development">https://myhudson.hccc.edu/career-development</a>
<u><b>Disability Support Services</b></u> <a href="mailto:dss@hccc.edu">dss@hccc.edu</a>	201-360-4157/4163 A Building, Floor 2 <a href="https://myhudson.hccc.edu/dss">https://myhudson.hccc.edu/dss</a>	201-360-4157/4163 Enrollment Services, Floor 1 <a href="https://myhudson.hccc.edu/dss">https://myhudson.hccc.edu/dss</a>
<u><b>Library</b></u> Journal Square <a href="mailto:librarian@hccc.edu">librarian@hccc.edu</a> North Hudson <a href="mailto:librarynhc@hccc.edu">librarynhc@hccc.edu</a>	201-360-4360 L Building, Floor 1 <a href="http://www.hccclibrary.net/">http://www.hccclibrary.net/</a>	201-360-4605 Floor 3 <a href="http://www.hccclibrary.net/">http://www.hccclibrary.net/</a>
<u><b>Tutoring Center</b></u> <a href="mailto:tc@hccc.edu">tc@hccc.edu</a>	201-360-4187 Lower Level of Library Building <a href="https://myhudson.hccc.edu/tutoring">https://myhudson.hccc.edu/tutoring</a>	201-360-4623 Floor 5, Room 511 <a href="https://myhudson.hccc.edu/tutoring">https://myhudson.hccc.edu/tutoring</a>
<u><b>Writing Center</b></u> <a href="mailto:wc@hccc.edu">wc@hccc.edu</a>	201-360-4370 J Building, Room 204 <a href="https://myhudson.hccc.edu/tutoring">https://myhudson.hccc.edu/tutoring</a>	201-360-4779 Floor 7, Room 703A <a href="https://myhudson.hccc.edu/tutoring/">https://myhudson.hccc.edu/tutoring/</a>