

HOSTOS COMMUNITY COLLEGE
Natural Sciences Department
Physical Sciences Unit

PHY 220

GENERAL PHYSICS II

4 credits, 3-hrs. lecture/2-hrs. lab/2-hrs. recitation

Schedule	Lecture:	
	Laboratory:	
	Recitation:	
Instructor:		E-mail:
Office:	Natural Sciences Department	Phone:
Office Hours:		
Required	Sears and Zemansky's University Physics With Modern Physics	
Textbooks:	By: Hugh D. Young, Roger A. Freedman (Addison-Wesley, 12th edition)	
	<i>ISBN: 0-8053-9185-1</i>	

A Laboratory Manual is also required and will be provided.

Pre-Requisites PHY 210
Pre/Corequisite: MAT 310 or HIGHER

Course Description:

Students will study waves and acoustics, optics, diffraction, electricity, D.C. circuits, magnetism, electromagnetism and their application, power and A.C. circuits. This course is intended for students preparing for careers in the sciences and engineering.

Course Objectives:

1. Understand the basic principles and general laws governing physics
2. Understand and apply the relationship among the topics that were taught
3. Utilize the first law of thermodynamics to derive equations to evaluate specific unknowns such as mass, volume and temperature for a system in thermal equilibrium and undergoing a change of state.
4. Determine the electric field in the region between the plates of a parallel plate capacitor knowing the net charge on the plates.
5. Evaluate the change in temperature or the rate of heat transfer when the material physical properties and/or geometry are provided.
6. Describe, derive and apply the equations including Ohms law, Lenz's law, Faraday's law, Bohr model etc.
7. Develop problem solving, analytical, and communication skills that will provide the foundation for lifelong learning and career development
8. Interpret scientific observation, apply scientific principles to analyze and solve real life problems
9. Understand and use the basic units and perform their conversion from one system to another.
10. Demonstrate the ability to derive basic kinematics equations, graphical and analytical interpretations of vector components, projectile motions other fundamental topics using calculus.
11. Accurately manipulate, extract and interpret laboratory data.

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12. Obtain essential skills necessary for success in graduate and professional schools, and for careers in industry and teaching.

13. Develop an appreciation for and an understanding of the significance of physical phenomena in our daily lives

Class Schedule:

WEEK	LECTURE	Week of
1.	<i>Physics Review</i>	
2.	<i>Ch. 15 – Mechanical Waves Ch. 16 – Sound and Hearing</i>	
3.	<i>Ch. 19- First Law of Thermodynamics: Applications. Thermodynamic Processes. Isobaric, Isovolumetric, and Isothermal Processes. Work in Thermodynamic Processes Ch. 20-The Second law of thermodynamics: Heat Engines and the second Law. Reversible and Irreversible Processes. Carnot Engines. Entropy. Entropy and Disorder</i>	
4.	<i>Ch.21-Electric Charges and Electric Field: Properties of Electric Charges. Insulators and Conductors. Coulomb’s Law. Electric Field. Electric Field Lines</i>	
5.	Exam 1 <i>Ch. 22/23 - Gauss’s Law. Electric Flux. Applications. Electric Potential and Electric Potential Energy. Potential Gradient. Equipotential Surfaces.</i>	
6.	<i>Ch.24-Capacitance and Dielectrics: capacitors in series/parallel, Gauss’s Law in Dielectric. Energy Stored in Capacitors.</i>	
7.	<i>Ch. 25/26- Current, Resistance, and Electromotive Potential: Direct-Current Circuits. Kirchoff Rules, Resistor in series and parallel, R-C circuits</i>	
8.	Exam 2 <i>Ch. 27-Magnetic Field and Magnetic Forces. Magnetic Field Lines and Magnetic Flux. Motion of Charged Particles in a Magnetic Field. The Hall Effect Ch. 28- Sources of a Magnetic Field. Magnetic Field of: a Moving Charge, Current Element, Straight Current Carrying Conductor, Between Parallel Conductors, and other Conductors. Ampere’s Law.</i>	
9.	<i>Ch. 29-Induction. Faraday’s Law. Lenz’s law. Induced Electric Fields. Eddy Currents. Displacement Current. Maxwell’s Equations. Inductance. Mutual and Self Inductance.</i>	
10.	<i>Ch. 30/Ch. 31- R-L, L-C, and L-R-C Series Circuit. Phasors and Alternating Current. Resistance and Reactance. Power in AC Circuits. Resonance. Transformers.</i>	
11.	Exam 3 <i>Ch. 32- Electromagnetic Waves. Maxwell’s Equations and E-M Waves. The E-M Spectrum.</i>	

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12.	<i>Ch. 33-The Nature of Light. Reflection, Refraction, Dispersion, Polarization, and Scattering of Light.</i>	
13.	<i>Ch. 34- Geometrical Optics. Lenses. Camera. Magnifier. Interference and Coherent Light. Diffraction</i>	
14.	<i>Ch. 35-Interference- Interference and coherent sources, Intensity in interference pattern</i>	
15.	<i>Ch. 36-Diffraction-Fresnel and Fraunhofer diffraction, diffraction grating, X-Ray diffraction</i>	
16.	Exam 4 <i>Physics II Review</i>	
17.	Final Exam	

Laboratory

No.	EXPERIMENT	DESCRIPTION
1	Waves	Lab experiment using standing waves in strings. Tests on wave interference and normal modes. Students will be tested on the theory of traveling and standing waves, and polarization by reflection.
2	Experiment 2	Selected tests to reflect the student's understanding of electric field interactions between charged particles. Calculations of electric fields caused by various distributions of electric field.
3	Experiment 3	Lab experiment that cover the diffraction grating and Interference. Lab experiment applying the principles of reflection, diffraction and dispersion.
4	Experiment 4	Lab experiment in electrostatic and the potential electrostatic field
5	Experiment 5	Lab experiment using the oscilloscope and the construction of RC circuits.
6	Experiment 6	Lab experiment the student learns to produce an electric current by electromagnetic induction. Students will be able to demonstrate Faraday's law of induction and Lenz's law. Students will be tested on Kirchhoff's loop rule for circuit analysis, Inductance and Inductors,
7	Experiment 7	Lab experiment using RCL circuits and resonance and the use of transformers.

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Graded assignments: The Final grade will be determined by the grades on lecture and lab combined as follows:

Lecture 75%

4-5 Exams (including the final exam)	50%
Assignments	15%
Class Participation	10%

Laboratory 25%

7 Lab Reports	10%
Exams and Quizzes on Lab Experiments.	10%
Laboratory Participation	5%

No student under any circumstances will be given a passing grade in this Physics course without passing the laboratory component. **Three (3) excused or unexcused absences to the lab sessions are equivalent to an F.**

Grading Policy:

The college uses the following grades:

A, A-, for excellent work
B+, B, for good work
B-, C, for fair work
D, for poor work
F, for failure

I, for incomplete
WU, for unfinished incomplete equivalent to **F**
W, for withdrawn

A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	70-76
D	60-69
F	Failure

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The grade of **Incomplete** is given in regular courses upon request of the student for personal emergencies that are verifiable. The faculty member has the responsibility to provide incomplete grade only to those students who are passing the course. The student has the responsibility to take the initiative in completing the work, and is expected to make up the incomplete during the first semester in residence after receiving the grade of **Incomplete**. If the student does not make up the incomplete during the following semester after receiving it, an **F** grade may be given by the faculty member without further consultation with the student. If after the end of the first semester the Incomplete remains on the record, it will be designated as an F and will be computed in the student's GPA.

There is no R grade in this course.

Participation:

Your participation in class is an important part of the final grade. This grade is based primarily on your participation in class discussions, in team projects and your attendance. For each class you miss, you will lose participation points. If you miss 25% or more of the term, you will be failed.

Academic policies:

Hostos Community College has an evaluation system based on the honesty and integrity of the academic work of an identified student or students. Faculty, students and staff have the responsibility to uphold the standards of the community and to take action when others violate them. Faculty members have an obligation to educate students to the standards of academic integrity, and to report violations of these standards to the appropriate authorities of the college. If a community member is proved with academic dishonesty, the college will impose sanctions. The three most common forms of academic dishonesty are cheating, plagiarism, and bribery. It must be understood that any student who knowingly aids in plagiarism or other cheating, e.g., allowing another student to copy a paper or examination question, is as guilty as the cheating student.

Cheating:

In the collegiate setting, cheating is defined as the purposeful misrepresentation of another's work as one's own. Faculty and students alike are responsible for upholding the integrity of this institution by not participating either directly or indirectly in act of cheating and by discouraging others from doing so.

Plagiarism:

Plagiarism is a form of cheating which occurs when persons, even if unintentionally, fail to acknowledge appropriately the sources for the ideas, language, concepts, inventions, etc. referred to in their own work. Thus, any attempt to claim another's intellectual or artistic work as one's own constitutes an act of plagiarism.

Bribery:

In the collegiate setting, bribery involves the offering, promising, or giving of items of value, such as money or gifts, to a person in a position of authority, such as a teacher, administrator, or staff member, so as to influence his/her judgment or conduct in favor of the student. The offering of sexual favors in exchange for a grade, test score, or other academic favor, shall be considered attempted bribery. The matter of sexual favors, either requested or offered, in exchange for a grade, test score or other academic favor shall also be handled as per the Sexual Harassment procedures of the College.