Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring 2025
Year: 2025
Course Prefix: PHYS
Course and Section #: 2020-003
Course Title: College Physics II
Credits: 4

Course Description

A continuation of PHYS 2010. Covers electricity, magnetism, waves, sound, optics, and nuclear physics.

Course Attributes

This course has the following attributes:
☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☒ Elective Core Requirements in Program
☒ Open Elective
Other: *Click here to enter text.*

Instructor Information

Instructor Name: Dr. Daniel James

Student Learning Outcomes

- Understand and apply the wave model of light.
- Understand and apply the ray model of light to lenses and mirrors and common optical instruments.
- Develop a basic understanding of electric charges, forces, and fields.
- Apply knowledge of electric potential to the human body using an EKG sensor.
- Learn how charges move through a conductor in a circuit and understand the fundamental principles that govern electric circuits.
- Apply knowledge of circuit components in a resonance circuit.
- Learn how magnetic fields exert forces on moving charges.
- Explore applications of electromagnetic induction.
- Understand the nature of electromagnetic waves.
- Understand and apply basic principles of AC electricity, electrical safety, and household electricity.
- Understand how special relativity affects time and space.
- Understand the quantization of energy for light and matter.
- Use quantum physics to understand the properties of atoms, molecules, and their spectra.

- Understand the physics of the nucleus and some of the applications of nuclear physics.

Course Materials and Texts

- **Text Book:** College Physics: A Strategic Approach, Knight/Jones/Field 4th ed.
- **Calculator:** A scientific calculator is sufficient. Graphing calculators are not needed.
- **Online Homework System Access:** Modified Mastering Physics
- **Smart Device:** Any device that can connect to the internet via wifi or cellular network such as a smartphone, tablet/iPod, iTouch, laptop, etc. (This is to access the e-text and Mastering portal)

Course Requirements

Course Assignments, Assessments, and Grading Policy

- Participation (Based on three short assignments): 3%
- Mastering Homework Assignments (weeks problem set through Pearson's Mastering Physics): 22%
- Homework Problems (Weekly handwritten problem set): 25%
- Four Exams that cover multiple chapters: 35%
- Final Comprehensive Exam: 15%

• **Grade**	• **Percentage**
A	93% and above
A-	90% - 92.9%
B+	87% - 89.9%
B	83% - 86.9%
B-	80% - 82.9%
C+	75% - 79.9%
C	70% - 74.9%
C-	63% - 69.9%
D+	58% - 62.9%
D	50% - 57.9%
E	Below 49.9%

Required or Recommended Reading Assignments

- College Physics: A Strategic Approach, Knight/Jones/Field 4th ed. Chapters 17-30

General Description of the Subject Matter of Each Lecture or Discussion

- Light, Double Slit Experiment
- Diffraction Gratings
- Thin Films
- Single Slit Interference, Circular Aperture
- Reflection and Refraction
- Images by Refraction & Thin Lenses
- Spherical Mirrors
- Camera, Human Eye, Magnifiers
- Microscopes and Telescopes
- Color, Dispersion, and Resolution
- Charges and Coulomb's Law
- Electric Field
- Conductors, Force/Torque in E field
- Electric Potential and Conservation of Energy
- Potential and Conservation of Energy
- Connecting Potential and Fields, EKG
- Capacitors
- Current and Voltage
- Ohm's Law, Energy and Power
- Circuit Diagrams and Kirchhoff's Laws
- Resistors in Series and Parallel
- Capacitors in Series and Parallel
- RC Circuits and Nerves
- Magnetism
- Calculating Magnetic Fields
- Forces on Moving Charges
- Torque on Dipoles and Magnetic Materials
- Motional EMF and Magnetic Flux
- Lenz's and Faraday's Laws
- EM Waves and Polarization
- EM Spectrum
- AC with Resistors and Transformers
- Household Circuits and Biological Effects
- AC with Capacitors and Inductors
- RLC Circuits
- Relativity
- Simultaneity and Time Dilation
- Length Contraction and Relative Velocity

- Relativistic Momentum and Energy
- X-rays and the Photoelectric Effect
- Photons, Matter Waves, Quantized Energy
- Quantum Jumps, Uncertainty Principle
- Spectroscopy and Atoms
- Bohr Model
- Quantum Mechanics and Multi-Electron Atoms
- Excited States, Molecules and Lasers
- Nuclear Structure and Stability
- Nuclear Force and Radioactivity
- Nuclear Decay and Medical Applications

Required Course Syllabus Statements

Generative AI
AI programs are not a replacement for your human creativity, originality, and critical thinking. Writing, thinking, and researching are crafts that you must develop over time to develop your own individual voice. At the same time, you should learn how to use AI and in what instances AI can be helpful to you.
The use of generative AI tools (e.g. ChatGPT, Google Gemini, Microsoft Copilot, etc.) are not to be used to generate homework solutions. You may consider using AI to help you study (e.g. The Pearson AI tools included with Mastering Physics.)

Using Remote Testing Software
☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity

At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX

Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.