

Course Syllabus for Physics 1402

Department : Mathematics and Engineering

Discipline : Physics

Course Number : Physics 1402

Course Title : General Physics II

Credit : 4 (includes lab) ; This course satisfies a lab requirement

Instructor: Dr. Gerald Bottrell

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Conference: M, Tu, Th, F 9:10 - 10:05

W 9:30 - 10:18

General Policies:

- Formative Assessment - 70%
- Summative Assessment - 30%
- Late work: 10 points/day late penalty – max of 50 points
- No extra credit

This course satisfies a core curriculum requirement: Yes – Life and Physical Science

Communication skills - to include effective written, oral, and visual communication

Critical Thinking skills - to include creative thinking, innovation, inquiry and analysis, evaluation and synthesis of information

Empirical and Quantitative skills - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

Teamwork skills - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

Prerequisites : Phys1401

Available Formats : conventional

Textbook : Physics, 6th Edition, Giancoli, Prentice Hall, 2005

Supplies: standard notebook paper and calculator

Course Specific Instruction : None

Course Description : This course is a continuation of Phys1401. Topics covered include thermodynamics, electricity, magnetism, optics, and modern physics.

Course Goal : The goal of this course is to continue providing foundational principles in

physics beyond mechanics.

Course Requirements : Students should attend every class session, lab, and perform each task as designated by the instructor

I. Student Learning Outcomes/Competencies :

1. Thermal Energy: Student will demonstrate a basic understanding of thermal energy.

- 1.1. Review the relationship between kinetic energy, temperature, latent and specific heat.
- 1.2. Introduce the first and second laws of thermodynamics and applications to heat engines.

2. Electromagnetic Energy: Student will demonstrate an understanding of electromagnetism.

- 2.1. Consider the fundamental concepts of electricity and electromagnetism, including electrostatic potential energy, potential difference, magnetic field, and induction.
- 2.2. State the general nature of electrical forces and electrical charges, and their relationship to electrical current.
- 2.3. Solve problems involving the inter-relationship of electrical charges, electrical forces, and electrical fields.
- 2.4. Apply Ohms law, and Kirchoff's laws, to the analysis of circuits with potential sources, capacitance, and resistance, including parallel and series capacitance and resistance.
- 2.5. Calculate the force on a charged particle between the plates of a parallel-plate capacitor.
- 2.6. Use Faraday's and Lenz's laws to find the electromotive forces.

3. Optics: Student will demonstrate a basic understanding of the wave nature of light.

- 3.1. Describe the wave nature of light and compare to the particle view of matter.
- 3.2. Articulate the principles of refraction, diffraction, interference and superposition of waves.

4. Modern Physics: Student will demonstrate a familiarity with concepts in modern physics

- 4.1. Discuss the philosophical shift and experimental evidence in Quantum Physics.
- 4.2. Expand upon the relationship between chemistry and atomic and nuclear physics.
- 4.3. Review recent history and modern trends in physics research

II. Student Learning Outcomes/Competencies for Laboratory Work:

1. Prepare laboratory reports that communicate experimental information compared with theoretical expectations.
2. Conduct basic laboratory experiments involving classical physics, beyond mechanics.

3. Relate physical observations and measurements of classical mechanics to theoretical principles.
4. Evaluate the accuracy of physical measurements and potential sources of error in measurements.
5. Work effectively with others in coordinating and executing laboratory experiments.

ADA Accommodation: Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability. For more information, call or visit the Disability Services Office in the Student Health & Wellness Office, 806-716-2577.

Equal Opportunity, Diversity, and Learning Environment : South Plains College strives to accommodate the individual needs of all students in order to enhance their opportunities for success in the context of a community college setting without regard to race, color, national origin, religion, gender, disability or age.

Accordingly, students will be expected to conduct themselves in a respectful and orderly manner conducive with intellectual exchange in a positive learning environment. (This includes no food and drink, cell phones off, or no distracting behavior)

Attendance Policy : Attendance and effort are important activities for success in this course. If you are absent, I encourage you to call regarding your assignments as necessary. A student who misses two consecutive weeks of classes or has missed five classes cumulatively may be dropped from this course. Please refer to the sections of your catalog listed as "Class Attendance" and "Drop and Withdrawals".