

PH 203 : GENERAL PHYSICS III

Transcript title

General Physics III

Credits

5

Grading mode

Standard letter grades

Total contact hours

70

Lecture hours

40

Lab hours

30

Course Description

Studies periodic behavior and topics from modern physics. Builds on concepts from previous terms and considers the physics of periodic motion, mechanical waves, wave interference, standing waves, acoustic waves, electromagnetic waves, geometric optics, diffraction and topics from special relativity to quantum mechanics. Lab includes basic optical experiences along with a long-term project to affirm student abilities to integrate investigative lab concepts from previous terms. Meets the basic requirements for many pre-health and life science programs. Should be taken in sequence.

Course learning outcomes

1. Identify the symbols and constants which are used to express concepts and laws.
2. Describe qualitative meaning of concepts and laws verbally, mathematically, and in writing.
3. Recognize application of concepts and laws to settings in daily life.
4. Apply concepts and laws appropriately to settings drawn from daily life.
5. Use concepts and laws successfully to predict or extrapolate the behavior of an object or system of objects.
6. Use graphical techniques to construct an equivalent alternative representation of the behavior of an object or system of objects.
7. Reinforce understanding through written descriptions and explanations of solution process.
8. Use concepts and laws to estimate a reasonable expectation for some physical value based on defensible evaluation of the physical parameters in the setting.
9. Integrate all of the above to construct a personal understanding of the relationship of this physics to the world.

Content outline

1. Simple harmonic behavior of physical and non physical systems
2. Harmonic waves - water, acoustic, seismic, and electromagnetic
3. Superposition of waves - standing waves for linear structures and chambers

4. Superposition of waves - interference (two sources)
5. Geometric optics
6. Reflection and refraction
7. Basic ray tracing techniques for determining image location
8. Optical wave effects
9. Polarization and color thin film interference
10. Single slit diffraction
11. Fundamentals of relativity - postulate, length contraction, time dilation
12. Topics from 20th century (quantum, cosmology, solid state, astrophysics)*

* Skills and expectations which are currently in development for curricular inclusion. May be only partially implemented at this time.

General education/Related instruction lists

- Science Lab