

NWACC Standard Course Outline
Science & Math Division

PHYS 2074 Advanced College Physics II

Catalog description

Continuation of Advanced College Physics I, Topics include electricity and magnetism, light, and optics. Lecture and laboratory

Prerequisite: PHYS 2054 with a grade of “C” or better.

Credit/ contact/ load hours 4 credit hours, 7 contact hours, 6 load hours

Target Audience and Transfer

This course is designed for students planning to take more advanced physics, astronomy or engineering courses. The course has been accepted by graduate and engineering schools for transfer credit. It will satisfy a 4 hour advanced physics requirement towards a B.A or B.Sc. degree.

General Course Objectives

At the conclusion of this course, students should be able to:

- (1) understand how the scientific method can be used to increase our knowledge of the world and the universe,
- (2) describe basic physical processes and relationships,
- (3) solve reasonably difficult physics problems using algebra, trigonometry, vector algebra and calculus,
- (4) communicate this information to others,
- (5) read material at an upper college level of educational difficulty and describe the main ideas presented described as well as the supporting ideas provided, and
- (6) use physical principles to solve practical problems.

Required Text

Serway and Jewett, Principles of Physics, A Calculus-Based Text, Fourth Edition, Volume 1, Brooks/Cole, 2006

Topics

1. Temperature
2. Thermodynamics
3. Heat Engines
4. Electric Forces
5. Electric Potential and Capacitance
6. Current and Direct Current Circuits
7. Magnetic Forces and Magnetic Fields
8. Faraday’s Law and Inductance
9. Electromagnetic Waves

10. Reflection and Refraction of Light
11. Mirrors and Lenses
12. Wave Optics
13. Quantum Physics
14. Atomic Physics
15. Nuclear Physics
16. Particle Physics

Required Instructional Activities

Laboratory Experiments: Physics laboratory experiments are conducted during periods of 2 to 3 hours each week. Physics Laboratory Experiments corresponding to the text material covered each week are conducted. Projects assigned to small groups allowing individuals to develop their communication skills as well as their analytical skills.