

Office of Academic Affairs  
Tarleton State University  
December 17, 2007

Master Course Syllabus Outline

Department: Mathematics, Physics, and Engineering  
Course Prefix/Number: PHYS 102-3  
Official Course Title: Essential Elements of Physics

- I. Catalog Description: This course introduces fundamental physics and astronomy concepts. Students are expected to design and conduct inquiry based experiments including the development of hypothesis, collection and analysis of data, and the use of appropriate laboratory equipment. Topics include motion, forces, energy, waves, light, electricity, magnetism, stellar and planetary evolution, and the atom. This course is required for Interdisciplinary Studies Majors.
- II. Prerequisites: MATH 107 College Algebra
- III. Intended Student Outcomes: Each student that passes this course with a C or better should be able to demonstrate an ability to:
  1. conduct laboratory investigations using safe and appropriate practices to include:
    - a) planning and implementing procedures
    - b) formulating hypotheses
    - c) selecting and using equipment and technology
    - d) collecting experimental data
    - e) analyze data to include constructing graphs and charts, draw inferences and predict trends
    - f) communicate valid conclusions
  2. apply the concepts of motion and Newton's Laws to analyze and explain physical phenomena
  3. apply the energy concepts including definitions of heat, potential energy, radiant energy, and kinetic energy to analyze and explain physical phenomena
  4. apply wave concepts including reflection, refraction, diffraction, and interference to analyze and explain wave phenomena
  5. apply the properties of light to analyze and explain various optical phenomena including the formation of shadows, color patterns in oil slicks, why the sky is blue, etc.
  6. be able to describe various historical models of the solar system and the experimental observations that each model correctly and/or incorrectly predicts
  7. describe the characteristics of the universe such as stars and galaxies

8. be able to relate the movements of the Earth and moon relative to the sun to various physical phenomena including the phases of the moon, seasons, length of the day, etc.
9. be able to use basic concepts in electricity and magnetism to analyze or describe various electromagnetic phenomena including electromagnetism, DC circuits, motors, and electrical power generation by electromagnetic induction.
10. effectively communicate mathematical and scientific information in written and oral form.
11. be able to distinguish between an investigable and non-investigable question
12. be able to describe the cultural, economic, philosophic and political impact of science discoveries in mechanics, astronomy, and electromagnetism upon society.

IV. Academic Honesty:

Cheating, plagiarism (submitting another person's materials or ideas as one's own), or doing work for another person who will receive academic credit are all-impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, or term papers, or the presentation of unacknowledged material as if it were the student's own work. Disciplinary action may be taken beyond the academic discipline administered by the faculty member who teaches the course in which the cheating took place.

V. Students with Disabilities Policy:

It is the policy of Tarleton State University to comply with the Americans with Disabilities Act (ADA) and other federal, state, and local laws relative to the provision of disability services. Students with disabilities attending Tarleton State University may contact the Office of Disability Services at (254) 968-9478 to request appropriate accommodation. Furthermore, formal accommodation requests cannot be made until the student has been officially admitted to Tarleton State University.