

Master Syllabus Physics 1014

Department: **Mathematics, Physics, Engineering and Hydrology**

Course Prefix: **PHYS101**

Official Course Title: **Great Ideas of Physics**

Master Syllabus approved by Department on:

I. Catalog Description:

This is a laboratory science course designed to introduce the student to the concepts of physics in an elementary mathematical setting, and to discuss their significance to science, technology and society. Topics will be drawn from both classical and contemporary physics.

II. Prerequisites:

Two semesters of high school algebra or MATH 1013.

III. Expanded Course Description:

Great Ideas of Physics is a one semester course to introduce students to the concepts and practices of physics. The course presents development of the nature of matter, understanding of motion and our place in the universe. Simple calculations in kinematics, dynamics, classical wave theory, thermodynamics, light, and gravity are executed. Selected topics from the theories of Relativity, General Relativity, Quantum Mechanics, and Particle Physics are discussed. Current advances in physics are also presented. Hands on experiments demonstrate Newtonian Physics, and Modern Theories of light. Students construct their own devices in several experiments.

IV. Intended Student Learning Outcomes:

A. Knowledge:

1. Know the different areas of physics
2. Understand how political and religious history affected the progress of science
3. Know the structure of matter from molecules, to atoms, to nuclei and electrons.
4. Understand scientific notation, and prefixes such as centi, milli, micro, kilo, mega, giga.
5. Know the definitions of key physics terms like velocity, acceleration, mass, energy, power, charge, electric fields, magnetic fields, etc..
6. Know the concepts involved in Newton's Three Laws of Motion, Newton's Law of Gravity, The Laws of Thermodynamics
7. Know the basic ideals needed to discuss simple electric circuits.
8. Understand the relationship of physics to engineering, chemistry and astronomy.

B. Skill Outcomes:

1. Be able to make simple calculations in one dimensional motion.
2. Be able to make simple calculations in energy and thermodynamic problems
3. Be able to draw and interpret linear graphs.
4. Be able to sketch and interpret exponential graphs.

5. Be able to see principles of physics in everyday action such as motion of cars, electrical power, etc.
6. Be able to write logically developed laboratory reports.

C. Value Outcomes:

1. Gain an appreciation of the process of scientific inquiry as applied to practical, technical and aesthetic situations.
2. Gain an appreciation of how the actions of humanity affect our environment.
3. Gain an appreciation of how all individual human actions have consequences upon the economic and social aspects of life.
4. Gain an appreciation of the individual's place on our planet and in the universe.

V. 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.

VI. 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.