

ACTIVE COURSE FILE*Curricular Area: PHYSICSCourse Number: 1150Course Title: Physics and SocietySemesterCredit Hours:3Clinical Hours: Lecture Hours:3Lab Hours:0

Course description to appear in catalog:

Study of applications of physics to society. This may specifically include the study of energy, thermodynamics, electrical power generation, electric circuits, nuclear power, nuclear weapons and modern particle physics.

Repeatable for credit: No

Pre-Enrollment Criteria:

Mathematics 0481 with a grade of ?C? or better or a qualifying score on the mathematics placement test.

A. General Course Objectives:

Upon successful completion of the course the student should be able to do the following:

1. Use observations to formulate hypotheses
2. Recognize that energy is conserved and that energy goes from more useful to less useful forms
3. Describe different forms of energy and how one form may be converted to another
4. Calculate the numerical values for different forms of energy (e.g thermal potential, kinetic, and mechanical) in simple situations where it is converted from one form to another
5. Identify the differences among heat, temperature, and internal energy
6. Explain how matter behaves when it absorbs or releases thermal energy
7. Explain the differences among conduction, convection, and radiation and how these different forms of energy transfer would apply in a home
8. Calculate the effect of different types of insulation in simple situation within a home
9. Identify, construct, and analyze simple electric circuits (series and parallel circuits)
10. Recognize the basic electric circuits within their home
11. Describe the flow of electricity in terms of voltage, current, and charge and demonstrate mathematical understanding of the relationship among amperes, volts, and watts
12. Describe how electrical power is generated
13. Describe how electrical power is transferred from point of generation to their home and identify any loss of useful power along the way
14. Explain why atoms are radioactive
15. Describe different types of radiation and their effects
16. Describe how electrical power is generated using nuclear power
17. Identify the elements in the nuclear fuel and waste cycle
18. Describe the basic design of a nuclear or atomic weapon
19. Describe the different effects of a nuclear weapon on both humans and materials
20. Calculate the probability of different effects of radiation on humans for simple situations
21. Explain how the Non-Proliferation Treaty relates to nuclear weapons and give its current status

22. Identify the fundamental particles in the Standard Model
23. Explain how the Standard Model of particle physics relates to some of the current cosmological models

B. Topical Outline:

1. Nature of science
2. Concept of Energy and its different forms
3. Heat and thermodynamics
4. Electric Circuits
5. Electrical Power Generation
6. Nuclear Power Generation
7. Design and Effects of Nuclear Weapons
8. Standard Model of Particle Physics and Cosmology

C. Methods of Evaluating Students:

1. Students will be evaluated using a combination of written assessments including assigned homework, quizzes, and tests.

<u>THOMAS CARTER</u>	<u>04-25-2008</u>	GERALD KRUSINSKI	_____
	<u>01/13/2009</u>		
Initiator	Date	Division Dean	Date

<u>THOMAS CARTER</u>	<u>04-25-2008</u>
Sponsor	Date