Master Syllabus Department of Physics and Astronomy



PHYC 659 Applications of Nuclear Techniques Workshop for Teachers

Course Description

The application of nuclear techniques in research, medicine, the environment, energy production, and industry. Designed for junior high and high school science teachers. laboratory oriented. Uses radiation detection devices and radiation safety procedures.

Prerequisite: PHYC 112 OR 122 or permission of the department chairperson.

Not open to students who have credit in PHYC 360 or 560.

Course Objectives

Laboratory and classroom activities will be presented. Following are representative topics discussed and experiments conducted:

Topics Covered

Nature of the Radioactive Decay Process

Methods of Detection of Nuclear Radiations

Safety Precautions in Laboratory

Statistics in Counting

Scintillation Spectrometry

Buildup and Decay of Radioactive Chains - Radon

Nuclear Energy - Fission and Fusion

Applications of Radiation in Medicine and Industry

List of Experiments Performed

Background Radiation

Plateau of a Geiger Counter

Counting statistics

Half life of Cs-137

Beta Ray Energies by Absorption

Gamma-Ray Absorption

Gamma-Ray Spectroscopy

Radon Determination in Homes

Self Absorption of Radioactive Barium Carbonate

Master Syllabus: PHYC 569

Course Rationale

This laboratory course is offered for teachers in order to provide a rapid overview of nuclear physics. This laboratory course is offered for teachers in order to provide a rapid overview of nuclear physics and laboratory equipment that is used in medicine and industry. This course provides teachers with topics that may be used in the chemistry, physics, and physical science classes. Problem solving and critical thinking skills are stressed in this course.

Course Content, Format, and Bibliography

This course will be offered on a summer workshop basis for teachers who desire updated training in this field. Emphasis will be place on activities that teachers may adapt to their classrooms. Activities will include the following: problem assignments, laboratory reports, individual projects, and the development of classroom activities.