Health Physics (HPHY)

Courses

HPHY 1199 Experimental Course: 1-6 semester hours.
The content of this course is not described in the catalog. Title and number of credits are announced in the Class Schedule. Experimental courses may be offered no more than three times with the same title and content. May be repeated.

HPHY 2217 RCT Internship: 3 semester hours.
Structured Internship. An optional experience taken as a class the summer prior to the start of the program. PREREQ: Acceptance into the program and permission of the program director. Su

HPHY 2218 Fundamentals of Radiation Protection Physics: 3 semester hours.
Atomic structure, nuclear structure, fission and fusion, radioactive decay, types of radiation, decay schemes, decay kinetics, interaction of radiation with matter, inverse square, attenuation, shielding, sources of radiation, reactors; accelerators, X-ray machines, units and terminology. F

HPHY 2219 RCT Internship II: 3 semester hours.
Structured Internship. A required class taken the summer between the first and second years of the program. PREREQ: Acceptance into the program and permission of the program director. Su

HPHY 2225 Radiation Protection Instrumentation: 3 semester hours.
Gas filled detectors: theory of operation, field applications, calibration and maintenance. Standard laboratory radiation detection instrumentation including solid state detectors, liquid scintillation detectors, scintillators, TLD and film dosimetry, and spectroscopy techniques. PREREQ: HPHY 2218. F

HPHY 2226 Radiation Protection I: 3 semester hours.
Principles of radiation protection; evaluating internal and external exposures and controls, survey, sampling and inspections, analytical techniques and emergency preparedness. PREREQ: HPHY 2218. S

HPHY 2227 Radiation Protection II: 3 semester hours.
Personnel dosimetry, prescribed dosimetry and radiation equipment, radiation protection dosimetry, procedures and programs (ALARA), industrial ventilation, PPE, contamination control, shielding, hazard evaluation primer on internal dosimetry and bioassay techniques. PREREQ: HPHY 2218. F

HPHY 2228 Health Physics Regulations: 3 semester hours.
Reviewing 10 CFR 19, 20, 30, 35, 835 and portions of 49 CFR dealing with shipment of Radioactive Materials and acquainting students with NCRP, NUREG, REG Guides, ICRP, etc. PREREQ: HPHY 2218. S

HPHY 2299 Experimental Course: 1-6 semester hours.
The content of this course is not described in the catalog. Title and number of credits are announced in the Class Schedule. Experimental courses may be offered no more than three times with the same title and content. May be repeated.

HPHY 3300 Medical Electronics: 2 semester hours.
A lecture-laboratory course covering circuit theory, qualitative theory of active devices and their applications to instrumentation. Laboratory work will be done with basic test instruments. Primarily for students in the allied health fields. PREREQ or COREQ: HPHY 3321. S

HPHY 3307 Radiobiology: 2 semester hours.
Survey of the effects of ionizing radiation on living matter at the sub cellular, cellular, and organismal levels. Equivalent to BIOL 3307. PREREQ: BIOL 1101 and one of the following: PHYS 1100, PHYS 1111, PHYS 2211, or HPHY 3321. S

HPHY 3321 Radiologic Physics: 2 semester hours.
Basic physics of x-ray production and the interaction of x-rays with matter. Includes topics in medical imaging. Available to juniors in Radiographic Science. PREREQ: PHYS 1100. S

HPHY 3399 Experimental Course: 1-6 semester hours.
The content of this course is not described in the catalog. Title and number of credits are announced in the Class Schedule. Experimental courses may be offered no more than three times with the same title and content. May be repeated.

HPHY 4411 Accelerator Health Physics: 3 semester hours.
Fundamentals of particle accelerator design and operation. Examination of the potential radiation environment associated with accelerators and health and safety issues of their operation. PREREQ: Senior standing in health physics or permission of instructor. D

HPHY 4412 Environmental Health Physics: 3 semester hours.
State-of-the-art applied mathematical techniques for estimating the release, transport, and fate of contaminants in multi-media environmental pathways (air, ground water, terrestrial). Both radiological and non-radiological contaminants will be addressed, with emphasis on radiological contaminants. PREREQ: Permission of instructor. Se

HPHY 4413 Fundamentals of Industrial Hygiene: 3 semester hours.
Overview on the recognition, evaluation, and control of hazards arising from physical agents in the occupational environment. The exposure consequences associated with agents of major occupational health concerns are considered. PREREQ: Permission of instructor. Se

HPHY 4416 Introduction to Nuclear Measurements: 3 semester hours.
Lecture/laboratory course emphasizing practical measurement techniques in nuclear physics. PREREQ: CHEM 1111 and PHYS 1111 and PHYS 1113 or PHYS 2211 and PHYS 2213. S

HPHY 4416L Radiation Detection and Measurement Lab: 0 semester hours.
Laboratory course emphasizing practical measurement techniques in nuclear physics.

HPHY 4417 Industrial Ventilation and Aerosol Physics: 3 semester hours.
This course focuses on two distinct subject areas: an elaboration on the details of the ACGIH method of local exhaust-system design, and a study of applied aerosol physics based upon trajectory analysis. PREREQ: Permission of instructor. Se

HPHY 4418 Nonionizing Radiation Protection: 3 semester hours.
Occupational safety and health issues of human exposure to nonionizing radiation. Topics include health concerns and safety strategies developed for extremely low frequency, microwave, radio-frequency, ultraviolet, infrared, laser radiation, and sound-waves. PREREQ: Permission of instructor. Se

HPHY 4419 Radiological Emergency Planning: 3 semester hours.
Radiological emergency planning for facilities ranging from reactors and other major nuclear facilities to transportation accidents and smaller-scale nuclear accidents. Topics include planning, co-ordination, "exercises", exposure pathways, modeling, measurement, control, decontamination, and recovery. PREREQ: Permission of instructor. Se

HPHY 4420 Reactor Health Physics: 3 semester hours.
Introduction to reactor physics; nuances peculiar to reactor health physics; reactor designs. Critiques of exposure pathways, accidents, decommissioning, contamination control, and emergency planning examine radiation safety approaches within the nuclear fuel cycle. PREREQ: Permission of instructor. Se

HPHY 4431 Radiation Physics I: 3 semester hours.
Atomic and nuclear structure, series and differential-equation descriptions of radioactive decay, physical theory of the interaction of radiation with matter suitable for the discipline of Health Physics. PREREQ: Permission of instructor. F

HPHY 4432 Radiation Physics II: 3 semester hours.
Continuation of HPHY 4431 considering dosimetric quantities/units, theory and technology of radiation detection and measurement, and radiobiology important to an advanced understanding of radiation protection. PREREQ: HPHY 4431 and permission of instructor. S

HPHY 4433 External Dosimetry: 3 semester hours.
Lecture course emphasizing external radiation protection including study of point kernel techniques, monte carlo modeling, and NCRP-49 methods. Also discussed are external dosimetry measurement techniques. PREREQ: HPHY 4432 or permission of instructor. F

HPHY 4434 Internal Dosimetry: 3 semester hours.
A lecture course emphasizing internal radiation protection including studies of ICRP-2, ICRP-26&30, ICRP-60&66, and MIRD methods of internal dosimetry. PREREQ: HPHY 4433 or permission of instructor. S

HPHY 4455 Topics in Health Physics I: 2 semester hours.
A lecture/seminar course covering special topics in Health Physics such as state and federal regulations, waste disposal methodology, and emergency procedures. PREREQ: HPHY 4432 or permission of instructor. F

HPHY 4456 Topics in Health Physics II: 2 semester hours.
A continuation of HPHY 4455. A lecture/seminar course covering special topics in Health Physics such as state and federal regulations, waste disposal methodology, and emergency procedures. PREREQ: HPHY 4432 or permission of instructor. S

HPHY 4460 Special Problems in Health Physics: 1-6 semester hours.
Course covering special problems and topics in health physics. Specific, evaluated undergraduate-level activities and/or performances are identified in the course syllabus. May be repeated. May be graded S/U. PREREQ: Permission of instructor. F, S

HPHY 4480 Health Physics Capstone Course: 3 semester hours.
Senior project involving development of an abstract, report, poster and oral presentation with synthesis of the many aspects of the undergraduate Health Physics education into a unified focused endpoint. PREREQ: Permission of instructor. F, S

HPHY 4488 Advanced Radiobiology: 3 semester hours.
An advanced-level class covering aspects of molecular radiobiology, teratogenesis, oncogenesis, and acute radiation illnesses. It also considers nonstochastic radiation effects and the epidemiology of radiation exposures. Equivalent to BIOL 4488. PREREQ: Permission of instructor. AF

HPHY 4490 ABHP Review: 3 semester hours.
A course for practical professionals aimed at the development and improvement of skills. May not be applied to undergraduate or gradute degrees. May be repeated. May be graded S/U. S

HPHY 4499 Experimental Course: 1-6 semester hours.
The content of this course is not described in the catalog. Title and number of credits are announced in the Class Schedule. Experimental courses may be offered no more than three times with the same title and content. May be repeated.