

HEALTH PHYSICS

The Bachelor of Science in Health Physics is an applied science with emphasis on biology, chemistry, mathematics and physics. Health Physicists are professionals whose concerns are the protection of people and the environment from harmful effects of radiation at medical and nuclear facilities. The ISU program has two tracks: a Bioscience Track (BST), and an Applied Physics Track (APT).

FIRST SEMESTER

<u>FIRST YEAR</u>	Cr.
CHEM 111 Gen Chemistry I	5
BIOL 101 Biology I	4
BIOL 101L Biology I Lab	0
MATH 147 Precalculus	5
Goals	<u>3</u>
	17

<u>SECOND YEAR</u>	Cr.
PHYS 111,113 (BST) Gen Phys/Lab	4
PHYS 211,213 (APT) Engr Phys/Lab	5
BIOS 209 (BST) General Ecology	4
MATH 175 (APT) Calculus II	4
Goals	<u>7</u>
	16

<u>THIRD YEAR</u>	Cr.
MATH 352 (APT) or BIOS 315 (BST)	3
CS 181 or CIS 220 Computer Prog.	3
BIOS 301 Anatomy & Physiology	4
PHYS g431 Radiation Physics I	3
Goals & HP Electives	<u>4</u>
	17

<u>FOURTH YEAR</u>	Cr.
PHYS g433 External Dosimetry	3
PHYS g455 Topics in HP I	2
PHYS g492 Colloquium in Phys	1
ENGL 307 Professional Writing	3
PHYS 480 Capstone (F or S)	3
Goals & HP Electives	<u>4</u>
	16

SECOND SEMESTER

<u>FIRST YEAR</u>	Cr.
CHEM 112 General Chem II	4
MATH 160 (BST) Brief Calculus	4
MATH 170 (APT) Calculus I	4
Goals	<u>4</u>
	16

<u>SECOND YEAR</u>	Cr.
CHEM 102 Essentials Chem II	5
PHYS 112,114 (BST) Gen Phys/Lab	4
PHYS 212,214 (APT) Engr Phys/Lab	5
MATH 275, (APT) Calculus III	4
Goals & HP Electives	<u>9</u>
	18

<u>THIRD YEAR</u>	Cr.
PHYS g416 Intro Nuc Measurements	3
PHYS g488 Adv. Radiobiology	3
PHYS g432 Radiation Physics II	3
BIOS 302 Anatomy & Physiology	4
Goals & HP Electives	<u>5</u>
	18

<u>FOURTH YEAR</u>	Cr.
PHYS g434 Internal Dosimetry	3
PHYS g456 Topics in HP II	2
PHYS g492 Colloquium in Physics	1
PHYS 480 Capstone (F or S)	3
Goals & HP Electives	<u>7</u>
	16

HEALTH PHYSICS CORE COURSES

g411 Accelerator Health Physics - 3 credits
Fundamentals of particle accelerator design and operation. Examination of the potential radiation environment associated with accelerators and the health and safety issues of their operation. Prereq: Senior standing in HP or permission of instructor.

g416 Intro Nuclear Measurements - 3 credits
A lecture and laboratory course emphasizing practical measurement techniques in Nuclear Physics. Prereq: Chem 111,112. Phys 111,113 or 211,213

g431-432 Radiation Physics I & II - 3 cr each.
A lecture course detailing atomic and nuclear structure, series and differential-equation descriptions of radioactive decay, physical theory of the interactions of radiation with matter suitable for the discipline of Health Physics.
432 - dosimetric quantities/units, theory and technology of radiation detection and measurement, and radiobiology important to an advanced understanding of radiation protection. Prereq: Junior standing in HP or permission of instructor.

g433-434 External/Internal Dosimetry - 3 cr. ea
A lecture course emphasizing external radiation protection including the study of point kernel techniques, monte carlo modeling, NCRP-49 methods, external dosimetry measurement techniques, internal radiation protection including studies of ICRP-2,26,30,60,66, and MIRD methods of internal dosimetry. Prereq: Phys g332 or permission of instructor.

g455-456 Topics in Health Physics I, II - 2 cr ea
A lecture/seminar course covering special topics in HP such as state and federal regulations, waste disposal methodology, and emergency procedures. Prereq: Phys g332 or permission of instructor.

480-Health Physics Capstone - 3 cr. 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. F or S. Co-ordinate with Health Physics professors.

g488 Adv. Radiobiology - 3 credits A lecture course covering aspects of molecular radiobiology, teratogenesis, oncogenesis, and acute radiation illnesses. It also considers nonstochastic radiation effects and the epidemiology of radiation exposures. Cross listed as BIOS g436 Prereq: Permission of instructor. S

g490 ABHP Review – 3 cr. A course for practicing professionals aimed at the development and improvement of skills

HEALTH PHYSICS ELECTIVE COURSES

Phys g412 Environmental Health Physics
Phys g413 Fundamentals of Industrial Hygiene
Phys g417 Industrial Ventilation & Aerosol Phys
Phys g418 Nonionizing Radiation Protection
Phys g419 Radiological Emergency Planning
Phys g420 Reactor Health Physics

OTHER USEFUL ELECTIVES

PHYS g301 (APT) Modern Physics
PHYS 403,404 Advanced Modern Phys
PHYS g409 Intro Nuclear Physics
PHYS g487 Medical Applications in Engr. & Physics
BIOS g462 (BST) Freshwater Ecology
BIOS g476 (BST) Ecology of Water Pollution

NS&E 402 Intro to Nuclear Engineering
NS&E g444 Nuclear Fuel Cycles

GEOL g430 Principles of Hydrogeology

MATH 230 Intro to Linear Algebra
MATH g360 Differential Equations

MGT g312 Indiv & Organizational Behavior
MGT g473 Human Resource Management

SPCH 208 Group Communication
SPCH 254 Organizational Communication
SPCH g452 Conflict Management

Revised 3/25/04