

# MAJOR IN HEALTH PHYSICS

Health Physics is the science of radiation safety. Health physicists work in industry and medical and research facilities to protect people and the environment from natural and man-made sources of radiation while also ensuring society can obtain the benefits of radiation with minimal risks. Students will begin their studies with foundational science courses including physics, biology, math, and chemistry. Health physics courses will provide a sound foundation in the basic skills essential to the health physics profession. All students in the Health Physics major will complete a professional internship for academic credit.

## Learning Objectives

Upon successful completion of this program, students will be able to:

1. Identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to health physics.
2. Demonstrate effective communication of health consequences, and risk management to workers and the public.
3. Understand the impact of solutions to contemporary public health issues in a global and societal context.
4. Apply techniques, skills, and modern scientific and technical tools necessary for professional practice of health physics.

## Requirements Effective Spring 2025

### Freshman

		AUCC	Credits
BZ 101 <sup>1</sup>	Humans and Other Animals (GT-SC2)	3A	3
CHEM 107	Fundamentals of Chemistry (GT-SC2)	3A	4
CHEM 108	Fundamentals of Chemistry Laboratory (GT-SC1)	3A	1
CO 150	College Composition (GT-CO2)	1A	3
MATH 160	Calculus for Physical Scientists I (GT-MA1)	1B	4
MATH 161	Calculus for Physical Scientists II (GT-MA1)	1B	4
Diversity, Equity, and Inclusion ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion</a> )		1C	3
Social and Behavioral Sciences ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences</a> )		3C	3
Electives			4
<b>Total Credits</b>			<b>29</b>

### Sophomore

PH 121	General Physics I (GT-SC1)	3A	5
PH 122	General Physics II (GT-SC1)	3A	5
PHIL 110	Logic and Critical Thinking (GT-AH3)	3B	3
Arts and Humanities ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities</a> )		3B	3
Historical Perspectives ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives</a> )		3D	3
Electives			7
<b>Total Credits</b>			<b>26</b>

### Junior

BMS 300	Principles of Human Physiology		4
CO 300 or 301B	Writing Arguments (GT-CO3)	2	3
	Writing in the Disciplines: Sciences (GT-CO3)		
ERHS 310	Basic Radiological Physics and Dosimetry I		3
ERHS 312	Basic Radiological Physics and Dosimetry II	4A	3
ERHS 450	Introduction to Radiation Biology		3
STAT 301	Introduction to Applied Statistical Methods		3
Program Electives - Select a minimum of 15 credits from the following:			15
BC 351	Principles of Biochemistry		
BMS 320	Virtual Laboratory in Physiology		
BUS 150	Business Computing Concepts and Applications		

BUS 205	Legal and Ethical Issues in Business		
BZ 120	Principles of Plant Biology (GT-SC1)	3A	
CHEM 245	Fundamentals of Organic Chemistry		
ERHS 313	Nuclear Instruments and Measurement Lab		
ERHS 332	Principles of Epidemiology		
ERHS 515	Non-Ionizing Radiation Safety		
ERHS 556	Monte Carlo Methods in Health Physics		
ERHS 570	Radioecology		
JTC 300	Strategic Writing and Communication (GT-CO3)	2	
JTC 301	Corporate and Professional Communication (GT-CO3)	2	
LB 300	Specialized Professional Writing	2	
LIFE 220/LAND 220	Fundamentals of Ecology (GT-SC2)	3A	
MGT 305	Fundamentals of Management		
MIP 300	General Microbiology		
PSY 253	Human Factors and Engineering Psychology		
SPCM 200	Public Speaking		
WR 204/GR 204	Sustainable Watersheds (GT-SC2)	3A	
<b>Total Credits</b>			<b>34</b>
<b>Senior</b>			
ERHS 311	Basic Nuclear Measurements and Instruments		1
ERHS 400	Radiation Safety		3
ERHS 461	Introduction to Radiation Public Health	4B	3
ERHS 488	Internship--Health Physics	4C	7-10
Electives <sup>2</sup>			14-17
<b>Total Credits</b>			<b>31</b>
<b>Program Total Credits:</b>			<b>120</b>

<sup>1</sup> BZ 101 is required unless a student has received a 4 or higher in AP Biology or IB Biology, or a passing CLEP score of 50+.

<sup>2</sup> Select enough elective credits to bring the program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).

## Major Completion Map

### Distinctive Requirements for Degree Program:

**To prepare for first semester:** The curriculum for the Computer Science major assumes students enter college prepared to take calculus. Entering students who are not prepared to take calculus will need to fulfill pre-calculus requirements in the first semester.

### **Freshman**

Semester 1		Critical	Recommended	AUCC	Credits
BZ 101	Humans and Other Animals (GT-SC2)	X		3A	3
CHEM 107	Fundamentals of Chemistry (GT-SC2)	X		3A	4
CHEM 108	Fundamentals of Chemistry Laboratory (GT-SC1)	X		3A	1
MATH 160	Calculus for Physical Scientists I (GT-MA1)	X		1B	4
Social and Behavioral Sciences ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences</a> )			X	3C	3
<b>Total Credits</b>					<b>15</b>
Semester 2		Critical	Recommended	AUCC	Credits
CO 150	College Composition (GT-CO2)	X		1A	3
MATH 161	Calculus for Physical Scientists II (GT-MA1)	X		1B	4
Electives					4
Diversity, Equity, and Inclusion ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion</a> )		X		1C	3
<b>Total Credits</b>					<b>14</b>

**Sophomore**

<b>Semester 3</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
PH 121	General Physics I (GT-SC1)	X		3A	5
PHIL 110	Logic and Critical Thinking (GT-AH3)	X		3B	3
Electives			X		4
<b>Total Credits</b>					<b>12</b>

<b>Semester 4</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
PH 122	General Physics II (GT-SC1)	X		3A	5
Electives			X		3
Arts and Humanities ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities</a> )			X	3B	3
Historical Perspectives ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives</a> )			X	3D	3
<b>Total Credits</b>					<b>14</b>

**Junior**

<b>Semester 5</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
BMS 300	Principles of Human Physiology	X			4
ERHS 310	Basic Radiological Physics and Dosimetry I	X			3
STAT 301	Introduction to Applied Statistical Methods	X			3
Program Electives (see list on Program Requirements tab)		X			6
<b>Total Credits</b>					<b>16</b>

<b>Semester 6</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
CO 300 or 301B	Writing Arguments (GT-CO3)	X		2	3
	Writing in the Disciplines: Sciences (GT-CO3)				
ERHS 312	Basic Radiological Physics and Dosimetry II	X		4A	3
ERHS 450	Introduction to Radiation Biology	X			3
Program Electives (see list on Program Requirements tab)		X			9
<b>Total Credits</b>					<b>18</b>

**Senior**

<b>Semester 7</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
ERHS 311	Basic Nuclear Measurements and Instruments	X			1
Electives			X		14
<b>Total Credits</b>					<b>15</b>

<b>Semester 8</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
ERHS 400	Radiation Safety	X			3
ERHS 461	Introduction to Radiation Public Health	X		4B	3
ERHS 488	Internship--Health Physics	X		4C	7-10
Electives		X			0-3
The benchmark courses for the 8th semester are the remaining courses in the entire program of study.		X			
<b>Total Credits</b>					<b>16</b>

**Program Total Credits: 120**