# 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.

Learn more about the online Major in Health Physics on the CSU Online website. (https://online.colostate.edu/degrees/health-physics/)

## 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[1] | 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 |
| 1C (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc) | | 1C | 3 |
| Social and Behavioral Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences) | | 3C | 3 |
| Electives | | | 4 |
| | **Total Credits** | | **29** |

**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 (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities) | | 3B | 3 |
| Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives) | | 3D | 3 |
| Electives | | | 7 |
| | **Total Credits** | | **26** |

**Junior**

| | | | |
|---|---|---|---|
| BMS 300 | Principles of Human Physiology | | 4 |
| CO 300 or 301B | Writing Arguments (GT-CO3)<br>Writing in the Disciplines: Sciences (GT-CO3) | 2 | 3 |
| 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 | |
| | **Total Credits** | | **34** |

**Senior**

| | | | |
|---|---|---|---|
| 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 [2] | | | 14-17 |
| | **Total Credits** | | **31** |
| | **Program Total Credits:** | | **120** |

[1] 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+.

[2] 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 Health Physics 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 (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences) | | | X | 3C | 3 |
| | **Total Credits** | | | | **15** |
| **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 |
| 1C (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc) | | X | | 1C | 3 |
| | **Total Credits** | | | | **14** |

***Sophomore***

| Semester 3 | | Critical | Recommended | AUCC | Credits |
|---|---|---|---|---|---|
| PH 121 | General Physics I (GT-SC1) | X | | 3A | 5 |
| PHIL 110 | Logic and Critical Thinking (GT-AH3) | X | | 3B | 3 |
| Electives | | | X | | 4 |
| | **Total Credits** | | | | **12** |
| **Semester 4** | | **Critical** | **Recommended** | **AUCC** | **Credits** |
| PH 122 | General Physics II (GT-SC1) | X | | 3A | 5 |
| Electives | | | X | | 3 |
| Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities) | | | X | 3B | 3 |
| Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives) | | | X | 3D | 3 |
| | **Total Credits** | | | | **14** |

***Junior***

| Semester 5 | | Critical | Recommended | AUCC | Credits |
|---|---|---|---|---|---|
| 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 |
| | **Total Credits** | | | | **16** |
| **Semester 6** | | **Critical** | **Recommended** | **AUCC** | **Credits** |
| CO 300 or 301B | Writing Arguments (GT-CO3)<br>Writing in the Disciplines: Sciences (GT-CO3) | X | | 2 | 3 |
| 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 |
| | **Total Credits** | | | | **18** |

***Senior***

| Semester 7 | | Critical | Recommended | AUCC | Credits |
|---|---|---|---|---|---|
| ERHS 311 | Basic Nuclear Measurements and Instruments | X | | | 1 |
| Electives | | | X | | 14 |
| | **Total Credits** | | | | **15** |
| **Semester 8** | | **Critical** | **Recommended** | **AUCC** | **Credits** |
| 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 | | | |
| | **Total Credits** | | | | **16** |
| | **Program Total Credits:** | | | | **120** |