# Climate and Biosystems Modeling Option

This option is offered within the following major(s):

- Bioresource Research - College of Agricultural Sciences (http://catalog.oregonstate.edu/college-departments/agricultural-sciences/other-degrees-programs/bioresource-research-bs-hbs)

The Climate and Biosystems Modeling option applies general systems theory to the analysis of climate, environmental and agricultural systems, and their interactions. Systems theory provides a method of analyzing overall system behavior by examining the relations among—and the behavior of—individual components, and synthesizing these relationships into a mathematical framework that describes the total system. Computer simulation using this mathematical framework can predict and analyze the response to various changes in the inputs to, and/or structure of, the system, providing a powerful tool for the development of comprehensive solutions to problems. Examples of topics for student research could include studying the effects of climate change on vectored disease transmission, marine biodiversity, distributions of crops and crop pathogens, the carbon and nitrogen cycles, and wildfire cycles.

The option is flexible; students design personalized programs and may complete a double major or minor if desired. This option will prepare students for challenging careers in governmental regulatory agencies and environmental consulting companies, or for graduate programs.

BRR students interested in climate and/or ecosystem research but not modeling should investigate the Sustainable Ecosystems option.

### Code | Title | Hours
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1. Climate | ATS 420 PRINCIPLES OF CLIMATE: PHYSICS OF CLIMATE AND CLIMATE CHANGE | 4
or GEOG 323 CLIMATOLOGY | 3-4
2. Biosystems | BI 370 ECOLOGY | 3-4
BOT 341 PLANT ECOLOGY | 4
CE 412 HYDROLOGY | 4
FE 430 WATERSHED PROCESSES | 4
FES 341 FOREST ECOLOGY | 4
FW 320 INTRODUCTORY POPULATION DYNAMICS | 4
OC 440 BIOLOGICAL OCEANOGRAPHY | 4
3. Quantitative Modeling | BEE 320 BIOSYSTEMS ANALYSIS AND MODELING | 3-4
ST 435 QUANTITATIVE ECOLOGY | 4
ST 443 APPLIED STOCHASTIC MODELS | 4
4. Computer Programming | CS 151 INTRODUCTION TO PROGRAMMING I WITH EMBEDDED CONTROL LAB | 4
CS 161 INTRODUCTION TO COMPUTER SCIENCE I | 4
5. Statistics | ST 411 & ST 412 METHODS OF DATA ANALYSIS and METHODS OF DATA ANALYSIS | 8
ST 421 & ST 422 INTRODUCTION TO MATHEMATICAL STATISTICS and INTRODUCTION TO MATHEMATICAL STATISTICS | 8

| Specialization and Breadth Courses | Select 6 to 9 credits approved by research mentor | 6-9
Total Hours | 36-41

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)

Option Code: 816