

Requirements for the B.S. Degree in *EARTH SYSTEMS*

The Earth Systems degree provides students with a holistic understanding of the Earth's geosphere, biosphere, hydrosphere, and cryosphere, as well as the impact of human activities on these systems. The degree is suitable for students interested in the interface of Earth Science and related fields, and in issues related to the long-term sustainability of the planet.

Requirements for the B.S. Degree

A. *Supporting Sciences* (8 courses listed here or their approved equivalents; 29-32 credits)

1. Two courses in Biology
Select from: BIOLOGY 103, 108, 109, 110, 151, 152, 280; STOCKSCH 100, 103, 105, 106, 108, 115, 120; GEOLOGY 107, 190BH; ENVSCI 101
2. Two courses in Calculus: MATH 127-128 or 131-132
3. Two courses in Physics with lab: PHYSICS 131-132 or 151-152
4. Two courses in General Chemistry with lab: CHEM 111-112

B. *Earth Systems Core Courses* (8 courses listed here or their approved equivalents; 28-29 credits)

1. Choose one of the following four introductory Geoscience courses:
GEOLOGY 101 The Earth (includes the lab component *Experiencing Geology*)
GEOLOGY 103* Introductory Oceanography
GEOLOGY 105* Dynamic Earth
GEOLOGY 110* Global Environmental Change
*students not taking GEOLOGY 101 must also take GEOLOGY 131 *Experiencing Geology* (1 credit), which is the lab-only part of Geology 101.
2. GEOGRAPHY 102 The Human Landscape
3. GEOLOGY 231 Introduction to Field Methods
4. GEOLOGY 201 History of the Earth
5. GEOGRAPHY 354 Climatology

6. Choose one of the following:
 - GEOGRAPHY 420 Human Impact on the Natural Environment
 - GEOGRAPHY 458 Climatic Change
 - GEOSCI 591NE Climate Impacts in the Northeast

7. Choose one of the following courses in Geochemistry:
 - GEOLOGY 415 Introduction to Geochemistry
 - GEOLOGY 597 Isotope Geochemistry
 - GEOLOGY 517 Sedimentary Geochemistry
 - GEOLOGY 519 Aqueous and Environmental Geochemistry
 - GEOLOGY 615 Organic and Biogeochemistry

8. Choose one of the following courses in climatology, oceanography, hydrology, and spatial analysis:
 - GEO-SCI 587 Hydrogeology
 - GEO-SCI 591C Climate and Environmental Modeling
 - GEOGRAPHY 426 Remote Sensing and Image Analysis
 - GEO-SCI 468 Geographical Information Systems and Spatial Analysis
 - GEO-SCI 595D Physical Oceanography

C. *Earth Systems Electives (12 credits)*

Students should select at least 12 credits of additional upper-division (300 and higher) courses in Geosciences (including a second course from B-6, B-7, and B-8 above), Biology, Computer Science, Environmental Sciences, Forestry, Mathematics, Microbiology, Natural Resources Conservation, Physics, Plant Soil and Insect Sciences, Political Science, Resource Economics, Resource Planning, Statistics, and Wildlife and Fisheries Conservation. Elective courses should broaden knowledge in one or more areas of Earth Systems and must be selected in consultation with an advisor.

D. *University Requirements for Major (6 credits)*

1. Junior Year Writing Requirement (3 credits):
 - NATSCI 387 CNS Junior Writing, or GEOGRAPHY 314 Writing in Geography
2. Integrative Experience (3 credits):
 - GEOLOGY 494LI Living on Earth, Real World Issues

Inquiries about the ***Earth Systems*** program should be directed to:

Professor R. Mark Leckie
Chief Undergraduate Advisor
Morrill Science Center IV South, Rm 252
mleckie@geo.umass.edu
545-1948

Students in **Commonwealth Honors College** should contact:

Professor Michele Cooke
cooke@geo.umass.edu