Earth Science

Major

Concentration in
- Environmental Science

Summary of Requirements for Major in Earth Science

1. Required Core Courses: (21 hours)
   - GEOG 103/113 Physical Geography (GEP Group C)
   - GEOG 207 Physical Geology and Geomorphology
   - GEOG 208 Earth Systems History
   - GEOG 275 Fundamentals of Geographic Data Handling (Tech. Fluency)
   - MATH 109 Elements of Applied Probability and Statistics (Core Skill 3)
   - GEOG 380 Research Methods in Geography

2. Required Supporting Science Sequence (8 hours)
   - Complete one of the following science sequences:
     - CHEM 201/202 General Chemistry I & II (GEP Group C)
     - PHY 215/216 General Physics I & II (GEP Group C)
     - PHY 261/262 Principles of Physics I & II (GEP Group C)
     - ENES 102 Statics/220 Mechanics of Materials

3. Advanced Electives (9-10 hours)
   - Complete three of the following courses:
     - GEOG 400 Global Climate Systems
     - GEOG 406 Management and Conservation of Natural Resources
     - GEOG 430 Surface Water Hydrology
       - or GEOG 335 Oceanography
     - GEOG 431 Quaternary Environments
       - or GEOG 441 Soil Analysis
     - GEOG 445 Biogeography
     - GEOG 460 Natural Hazards in the Physical Environment
     - GEOG 476 Fluvial/Coastal Geomorphology
       - or GEOG 475 Glacial/Periglacial Geomorphology
     - CHEM 420 Environmental Chemical Analysis
       - or CHEM 320 Quantitative Analytical Chemistry
     - CHEM 460 Environmental Chemistry

4. Technique Courses (3 hours)
   - Complete one of the following courses:
     - GEOG 310 Fundamentals of Cartography
     - GEOG 317 Principles of Geographic Information Science
     - GEOG 413 Remote Sensing – Image Interpretation
     - GEOG 433 Surveying and Field Techniques

5. Additional Mathematics Course (3-4 hours)
   - Complete one of the following courses:
     - MATH 119 College Algebra (Core Skill 3)
     - MATH 220 Calculus for Applications I
     - MATH 236 Calculus I (Core Skill 3)
     - MATH 237 Calculus II

6. Senior Requirement (6 hours)
   - Complete one of the following options:
     - A. Research Option
       - GEOG 482 Senior Project (I)
       - GEOG 483 Senior Project (II)
     - B. Technical Option
       - Take one additional course from Advanced Electives and one from Technique Courses.

7. Capstone Experience (1 hour)
   - GEOG 486 Earth Science Capstone

Summary of Requirements for Double Major in Secondary Teacher Education

If you wish to complete a Maryland State-approved program in teaching secondary earth & space science, you must:
- Complete the BS in Earth Science.
- Declare a second major in Secondary Teacher Education. See the Secondary Teacher Education Program Coordinator for details.
- In addition to the regular major requirements, you must take coursework in biology, chemistry, and physics in order to qualify for Maryland State certification in science and to meet NCATE accreditation standards. See the Secondary Teacher Education Program Coordinator for details.
The Environmental Science concentration is dedicated to the study of the relationships between humans and their environments.

- You will become sensitive, articulate, and knowledgeable about increasingly complex environmental issues facing contemporary society.
- Course work in this concentration will provide the theoretical and practical background as well as the skills necessary to study environmental science from a wide range of perspectives.
- You must meet certain criteria and deadlines prior to enrollment in either GEOG 488 or GEOG 492.
- You must select 2 other members for your advisory committee in addition to your advisor from the faculty in participating departments. At least 1 member of the committee must be from Geography.

Summary of Requirements for Environmental Science Concentration in Earth Science

1. Introductory Level Courses: (16 hours)
   - GEOG 103/113 Physical Geography (GEP Group C)
   - GEOG 104/114 Human Geography (GEP Group D or F)
   - or GEOG 110 World Regional Geography: Cultural Diversity (GEP Group D or F)
   - GEOG 275 Fundamentals of Geographic Data Handling (Tech. Fluency)
   - MATH 109 Elements of Probability and Statistics (Core Skill 3)
   - MATH 119 College Algebra (Core Skill 3)

2. Required Advanced Courses: (15 hours)
   - GEOG 380 Research Methods in Geography
   - GEOG 406 Management and Conservation of Natural Resources
   - GEOG 445 Biogeography
   - GEOG 472 Environmental Planning or GEOG 473 Environmental Law
   - GEOG 486 Earth Science Capstone
   - GEOG 488 Environmental Practicum or GEOG 492 Internship: Research in Geography*
   *requires co-registration in GEOG 495

3. Required Supporting Science Sequence: (16 hours)
   - BIOL 149 General Biology I (GEP Group C)
   - BIOL 160 General Zoology
   - or BIOL 161 General Botany
   - CHEM 201 General Chemistry I (GEP Group C)
   - CHEM 202 General Chemistry II

4. Electives: (24-25 hours)
   Select two courses in each group:**
   **some of these courses may require additional prerequisite course work.

GROUP I Advanced Biology
   - BIOL 314 Plant Taxonomy or BIOL 305 Dendrology
   - BIOL 340 General Ecology
   - BIOL 406 Ornithology
   - BIOL 421 Sample Design and Analysis of Plant Communities
   - BIOL 422 Herpetology
   - BIOL 423 Mammalogy
   - BIOL 430 Introductory Limnology

GROUP II Advanced Techniques
   - GEOG 310 Fundamentals of Cartography
   - GEOG 317 Principles of Geographic Information Science
   - GEOG 413 Remote Sensing - Image Interpretation
   - GEOG 420 Topics in the Mapping and Geospatial Sciences
   - GEOG 433 Surveying and Field Techniques

GROUP III Advanced Physical Geography
   - GEOG 335 Oceanography
   - GEOG 340 Soil: Genesis, Nature and Characterization
   - GEOG 405 Global Climate System
   - GEOG 430 Surface Water Hydrology
   - GEOG 431 Quaternary Environments
   - GEOG 432 Groundwater Hydrology
   - GEOG 460 Natural Hazards in the Physical Environment

GROUP IV Advanced Human Systems
   Take two of the following from two different disciplines:
   - ECON 410 Resource and Environmental Economics
   - ENGL 440 Literature of the Environment
   - GEOG 300 Economic Geography
   - GEOG 407 Political Geography
   - GEOG 410 Locational Analysis
   - HIST 409 World Environmental History
   - PHIL 315 Philosophy and the Environment
   - POSC 450 Environmental Public Policy