Students electing this minor may acquire more information from the creative writing adviser of the Department of English, the School of Media Arts and Design, or the School of Theatre and Dance.

Required Courses

Select four or five courses from the offerings of at least one department:

- ENG 391. Introduction to Creative Writing — Nonfiction 3
- ENG 392. Introduction to Creative Writing — Poetry 3
- ENG 393. Introduction to Creative Writing — Fiction 3
- ENG 493. Advanced Creative Nonfiction 3
- ENG 494. Advanced Poetry Writing 3
- ENG 495. Advanced Fiction Writing 3
- SMAD 250. Scriptwriting (subject to availability) 3
- SMAD 251. Screenplay Writing 3
- SMAD 311. Feature Writing 3
- SMAD 340. Advanced Screenplay Writing 3
- SMAD 498. Senior Seminar (when topic is appropriate) 1
- THEA 347. Playwriting (crosslisted with ENG 347) 3
- THEA 440. Seminar in Theatre (when topic is appropriate) 1
- THEA 447. Advanced Playwriting 3

Select one or two courses from the following:

- ENG 483. Narrative Form 3
- ENG 484. Poetic Craft and Creativity 3
- ENG 496. Advanced Topics in Creative Writing 3
- SMAD 373. Media Analysis and Criticism 3
- SMAD 463. Film Adaptations 3
- THEA 481. Theory and Performance Studies 3
- THEA 483. Introduction to Creative Writing — Drama 3
- SMAD 340. Advanced Screenplay Writing 3
- THEA 497. 270. Special Topics in Theatre 3
- SMAD 311. Feature Writing 3
- SMAD 340. Advanced Screenplay Writing 3
- SMAD 498. Senior Seminar (when topic is appropriate) 1
- THEA 347. Playwriting (crosslisted with ENG 347) 3
- THEA 440. Seminar in Theatre (when topic is appropriate) 1
- THEA 447. Advanced Playwriting 3

Select one or two courses from the following:

- THEA 481. Theory and Performance Studies 3
- THEA 483. Introduction to Creative Writing — Drama 3
- SMAD 340. Advanced Screenplay Writing 3
- THEA 497. 270. Special Topics in Theatre 3
- SMAD 311. Feature Writing 3
- SMAD 340. Advanced Screenplay Writing 3
- THEA 440. Seminar in Theatre (when topic is appropriate) 1
- THEA 447. Advanced Playwriting 3

The cross disciplinary minor in criminal justice is designed for students who are preparing for careers in law enforcement, corrections, judicial administration or other areas related to the study or management of crime, either directly upon graduation or after further graduate training.

Required Courses

- CRJU 215. Introduction to Criminal Justice 3
- CRJU 225. Ethics in Criminal Justice 3
- CRJU 330. Corrections 3
- CRJU 335. Law Enforcement 3
- CRJU 337. Courts and the Judiciary 3
- CRJU 339. Criminal Investigation and Evidence 3
- CRJU 340. Administration in Criminal Justice 3

Choose two additional courses from those listed above or from the following:

- CRJU 301. Special Topics in Criminal Justice 3
- CRJU 401. Internship in Criminal Justice 3
- CRJU 454. Criminal Justice Internship 3

Environmental Information Systems

Dr. Steven P. Frysinger, Coordinator

Phone: (540) 568-2710 E-mail: frysinsp@jmu.edu

The cross disciplinary minor in environmental information systems is designed for undergraduates interested in using computer and information management technology to solve environmental problems and improve environmental stewardship. Some examples of environmental information systems are database systems to track and report hazardous materials in factories, decision support systems to facilitate risk analysis and management, GIS-based natural resource inventory systems, and automated business management systems to support and document environmental compliance.

The environmental information systems minor requires a minimum of 24 credit hours. Core courses are intended to ensure knowledge of the foundation disciplines. Electives should be chosen in consideration of the student’s particular interests within the general field of environmental information systems. At least one elective course must be outside of the student’s major. Students are advised to check prerequisites of listed courses.

Required Courses

Core Courses

- CS 139. Algorithm Development 1 4
- CS 274. Introduction to Databases 1 3
- ISAT 320. Fundamentals of Environmental Science and Technology 1 3
- ISAT 321. Fundamentals of Environmental Science and Technology 2 3
- GEOG 215. Geospatial Tools I — Cartography and GIS 1 3

Elective Courses

- CIS/MS 364. Decision Support Systems 3
- CS 239. Advanced Computer Programming 1 4
- CS 474. Database Design and Application 1 3
- GEOG 261. Geospatial Tools I — Remote Sensing and GIS 3
- GEOG 366. Introduction to Geographic Information Science 3
- GEOG 385. Principles of Remote Sensing 4
- GEOG 466. GIS and Geographic Databases 3
- ISAT 341. Modeling and Simulation 3
- ISAT 420. Environmental Analysis and Modeling 3
- ISAT 426. Environmental Information Systems 24

Environmental Management

Dr. Steven P. Frysinger, Coordinator

Phone: (540) 568-2710 E-mail: frysinsp@jmu.edu

The cross disciplinary environmental management minor prepares students to apply the principles of environmental science and engineering to contemporary environmental problems in natural resource, industrial and public policy contexts. The minor is particularly suitable for students interested in professional careers in industrial environmental management, natural resources management, and environmental policy and planning. After fulfilling prerequisite requirements in biology and statistics, students pursue the minor by completing core courses and electives.
The environmental management minor strives to develop graduates who can apply science and technology to a broad range of practical environmental problems in a variety of professional settings. Students are expected to be literate and competent in the sciences and mathematics underlying environmental problem solving. The environmental management minor requires a total of 29 credits, including prerequisite courses. The prerequisites must have been completed successfully before the student may be enrolled in the environmental management minor. Prerequisite courses may be fulfilled as part of the student’s major. At least one elective course must be outside of the student’s major.

**Prerequisites**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 124</td>
<td>4</td>
</tr>
<tr>
<td>ISAT 251</td>
<td>3</td>
</tr>
<tr>
<td>MATH 220</td>
<td>3</td>
</tr>
<tr>
<td>MATH 285</td>
<td>3</td>
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<tr>
<td>MATH 307</td>
<td>3</td>
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<tr>
<td>MATH 318</td>
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**Required Courses**

<table>
<thead>
<tr>
<th>Group</th>
<th>Course Code</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>ISAT 320-321. Fundamentals of Environmental Science and Technology</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>CHM 221. Concepts of Organic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>ISAT 302. Instrumentation and Measurement of the Environment</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>ENVT 400. Capstone Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

**Concentration**

See descriptions below

1 May also be fulfilled by CHEM 341-342 sequence.

**Concentrations**

Students completing the environmental management minor must concentrate in one of three areas: natural resources, industrial systems or environmental policy. Students should be aware that some of the listed courses may have additional prerequisites.

**Natural Resources**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ISAT 244</td>
<td>4</td>
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</tbody>
</table>

Choose two of the following courses:

- BIO 456. Landscape Ecology
- BIO 457. Biological Applications of Geographic Information Systems
- BIO 459. Freshwater Ecology
- BIO 465. Environmental Toxicology
- CHM 354. Environmental Chemistry Field Camp
- GEOG/GEOL 355. Geochemistry of Natural Waters
- GEOG 340. Biogeography
- GEOG 341. Wilderness Techniques
- GEOG 342. Management and Protection of Natural Resources
- GEOG 343. Wildlife Management
- GEOG 340. Soils and Land Use
- ISAT 420. Environmental Analysis and Modeling
- ISAT 425. Environmental Hydrology
- ISAT 429. Sustainability: An Ecological Process

**Industrial Systems**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ISAT 422</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose two of the following courses:

- HTH 352. Environmental Health
- HTH 450. Epidemiology
- ISAT 423. Environmental Remediation
- ISAT 427. Industrial Hygiene
- ISAT 428. Industrial Ecology

**Environmental Policy**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>ISAT 421</td>
<td>3</td>
</tr>
<tr>
<td>ISAT 422</td>
<td>3</td>
</tr>
</tbody>
</table>

One of the following courses:

- BIO 465. Environmental Toxicology
- ECON 305. Environmental Economics
- ECON 340. Economics of Natural Resources

**Required Courses**

<table>
<thead>
<tr>
<th>Group</th>
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<tbody>
<tr>
<td>1</td>
<td>BIO 124. Ecology and Evolution</td>
<td>3-4</td>
</tr>
<tr>
<td>2</td>
<td>ISAT 400. Environmental Management</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>ISAT 423. Environmental Remediation</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>ISAT 424. Natural Resource Management</td>
<td>3</td>
</tr>
</tbody>
</table>

- BIO 465. Environmental Toxicology
- ECON 305. Environmental Economics
- ECON 340. Economics of Natural Resources

**Environmental Science**

**Dr. Bruce Wiggins, Coordinator**

Phone: (540) 568-6196 E-mail: wiggina@jmu.edu

Web site: http://www.jmu.edu/environment/science.shtml

The environmental science minor is a cross disciplinary program that can be elected by any student. Students pursuing programs ranging from the physical, natural or social sciences, to education, journalism, or business could benefit from this broadly based environmental curriculum. The program draws from courses that focus on the application of scientific concepts and principles to the understanding of environmental problems and their solutions. The minor draws upon the expertise of faculty in the areas of biology, chemistry, geography, physics, and integrated science and technology.

The environmental science minor:

- provides a scientific background to those students interested in environmental law, environmental economics and environmental sustainability.
- broadens the student’s understanding of how sciences are linked to environmental questions.
- complements any major by focusing on courses related to environmental issues.

The minimum requirement for a minor in environmental science is 24 credit hours taken from the four groups outlined below. Students wishing to complete more than one of the environmental minors (environmental management, environmental science and environmental studies) may receive dual credit for the capstone course (ENVT 400), but may not receive dual credit for any other courses that might be shared by the minors. Pre-approved study abroad and/or internship experiences may be substituted for one or more of the courses listed below.

No more than two courses from a single subject area can count toward the completion of the Environmental Science minor.

A score of four or greater in AP Environmental Science substitutes for G3EOL 115 or ISAT 112.

**Courses**

<table>
<thead>
<tr>
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<td>ISAT 423. Environmental Remediation</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>ISAT 424. Natural Resource Management</td>
<td>3</td>
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</tbody>
</table>

- ISAT 400. Environment: Earth
- ISAT 112. Environmental Issues in Science and Technology
- G3EOL 210. Physical Geography

Group 2. Advanced Environmental Science courses

- BIO 354. Global Climate and Life
- BIO/G3EOL 400. Geology and Ecology of the Bahamas
- BIO/G3EOL 402. Forest Ecology
- BIO 451. Ecological Systems
- BIO 452. Population Ecology
- BIO 453. Microbial Ecology and Evolution
- BIO 454. Introduction to Biometrics
- BIO 456. Landscape Ecology
- BIO 457. Biological Applications of GIS

**Groups Credit Hours**

Group 1. Introduction to Environmental Science

- BIO 124. Ecology and Evolution
- G3EOL 102. Environment: Earth
- G3EOL 115. Earth Systems and Climate Change
- ISAT 112. Environmental Issues in Science and Technology
- G3EOL 210. Physical Geography

Group 2. Advanced Environmental Science courses

- BIO 354. Global Climate and Life
- BIO/G3EOL 400. Geology and Ecology of the Bahamas
- BIO/G3EOL 402. Forest Ecology
- BIO 451. Ecological Systems
- BIO 452. Population Ecology
- BIO 453. Microbial Ecology and Evolution
- BIO 454. Introduction to Biometrics
- BIO 456. Landscape Ecology
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