While every effort has been made to provide accurate information, this requirement sheet is for advising purposes only and is not an official document.

**GENERAL EDUCATION**

**COMMON GROUND (~ 24-30cr)**

See [http://gened.iub.edu/](http://gened.iub.edu/) for current requirements and course lists

**FOUNDATIONS**

- Both of the following requirements:
  - English Composition (3cr)
  - Mathematical Modeling (3-4cr) (satisfied by BSES requirements)

**BREADTH OF INQUIRY**

- The following three requirements:
  - Arts and Humanities (6cr)
  - Social and Historical Studies (6cr) (BSES majors encouraged to consider SPEA-V 220, CMCL-C 212, ECON-E 201 or E 202)
  - Natural and Mathematical Sciences (5-6cr) (satisfied by BSES requirements)

**WORLD LANGUAGES AND CULTURES**

- One of the following options:
  - Language Studies (through second year of single language)
  - World Culture courses (6cr)

- International Experience (in approved study abroad program)

**COMMUNICATION (9cr)**

- One of the following courses:
  - ENG-W 231 Professional Writing Skills (3cr) (P: English composition)
  - ENG-W 240 Community Service Writing (3cr) (P: English composition)
  - ENG-W 270 Argumentative Writing (3cr) (P: English composition)

- One of the following courses:
  - CMCL-C 121 Public Speaking (3cr) (ended after fall 2013)
  - COLL-P 155 Public Oral Communication (3cr)
  - SPEA-V 260 Speaking, Listening, and Public Affairs (3cr)

- One course to satisfy the College of Arts and Sciences Intensive Writing requirement. For a list of Intensive Writing courses, see the Special Course Listings on the Registrar’s website at [http://registrar.indiana.edu/specialcourse.shtml](http://registrar.indiana.edu/specialcourse.shtml).

**BSES FOUNDATION**

**MATHEMATICS, STATISTICS, AND COMPUTATION (12-16cr)**

- One of the following options:
  - MATH-M 119 Brief Survey of Calculus I (3cr) (P: Two years high school algebra or MATH-M 014)
  - MATH-M 120 Brief Survey of Calculus II (3cr) (P: MATH-M 119)
  - MATH-M 211 Calculus I

- One of the following courses:
  - MATH-K 310 Statistical Techniques (3cr) (P: MATH-M 119 or equivalent)
  - SPEA-K 300 Statistical Techniques (3cr) (P: MATH-M 014 or equivalent, R: MATH-M 118)
  - STAT-K 310 Statistical Techniques (3cr) (P: MATH-M 119 or equivalent)

- One of the following courses:
  - GEOG-G 250 Computing in the Geospatial Sciences (3cr) (P: One of MATH-M 118, M 119, M 211, or equivalent, or consent of instructor)
  - SPEA-E 325 Computing for Environmental Scientists (2cr)

- At least one of the following courses:
  - CSCL-A 321 Computing Tools for Scientific Research (4cr) (P: MATH-M 118 or higher; M 211 recommended)
  - GEOG-G 488 Applied Spatial Statistics (3cr) (P: 6cr of Geography or consent of instructor)
  - MATH-M 212 Calculus II (4cr) (P: MATH-M 211 or M 119 and X 201)
  - MATH-M 343 Introduction to Differential Equations with Applications I (3cr) (P: MATH-M 212)
  - MATH-M 365 Introduction to Probability and Statistics (3cr) (P: MATH-M 212)
  - SPEA-E 426 Applied Math for Environmental Science (3cr) (P: Differential and integral calculus)

**CHEMISTRY (10-11cr)**

- The following three requirements:
  - CHEM-C 117 Principles of Chemistry and Biochemistry I (3cr)
  - CHEM-C 127 Principles of Chemistry and Biochemistry I Laboratory (2cr) (P or C: CHEM-C 117)
  - CHEM-C 341 Organic Chemistry I Lectures (3cr) OR CHEM-R 340 Survey of Organic Chemistry (3cr)

- One of the following courses:
  - CHEM-A 314 Biological and Environmental Chemical Analysis (2cr) (P: CHEM-C 341, S 341, or R 340 and MATH-M 119 or M 211)
  - CHEM-C 342 Organic Chemistry II Lectures (3cr) (P: CHEM-C 341 or S 341)
  - SPEA-E 464 Organic Pollutants: Environmental Chemistry and Fate (3cr) (R: CHEM-C 341 or R 340)
  - GEOL-G 444 Methods in Analytical Geochemistry (2cr)
**BIOLOGY (6cr)**
- Both of the following courses:
  - BIO-L 111 Foundations of Biology: Diversity, Evolution, and Ecology (3cr)
  - BIO-L 112 Foundations of Biology: Biological Mechanisms (3cr) (P: High school or college chemistry)

**PHYSICS (10cr)**
- One of the following options:
  - PHYS-P 201 General Physics I (5cr) **AND** PHYS-P 202 General Physics II (5cr)
  - PHYS-P 221 Physics I (5cr) **AND** PHYS-P 222 Physics II (5cr)

**ENVIRONMENTAL SCIENCE (30cr)**
- One of the following courses:
  - GEOG-G 222 The City as Ecosystem (3cr)
  - GEOG-G 107 Physical Systems of the Environment (3cr)
  - GEOG-G 208 Environment and Society (3cr)
  - SPEA-E 272 Introduction to Environmental Science (3cr)
- Additional courses from the following list to total at least 27 credit hours. Students are strongly encouraged to select courses in consultation with an academic advisor or environmental science faculty member:

| BIO-L 371 Ecological Plant Physiology (3 cr.) | GEOL-G 225 Earth Materials (4 cr.) |
| BIOL-211 Molecular Biology (3 cr.) | GEOL-G 316 Mineral Fuels and Materials (3 cr.) |
| BIOL-307 Biodiversity (3 cr.) | GEOL-G 328 Energy, Resources, and the Environment (3 cr.) |
| BIOL-311 Genetics (3 cr.) | GEOL-G 334 Principles of Sedimentology and Stratigraphy (4 cr.) |
| BIOL-318 Evolution (3 cr.) | GEOL-G 413 Introduction to Geophysics (3 cr.) |
| BIOL-319 Genetics Laboratory (3 cr.) | GEOL-G 415 Principles of Geomorphology (3 cr.) |
| BIOL-376 Biology of Birds (4 cr.) | GEOL-G 438 Air Pollution Meteorology (3 cr.) |
| BIOL-465 Advanced Field Biology (3 cr.) | GEOL-G 444 Methods in Analytical Geochemistry (1-2 cr.) |
| BIOL-472 Microbial Ecology (3 cr.) | GEOL-G 451 Principles of Hydrogeology (3 cr.) |
| BIOL-473 Ecology (3 cr.) | PHYS-P 317 Signals and Information Processing in Living Systems (3 cr.) |
| BIOL-474 Field and Laboratory Ecology (2 cr.) | SPEA-E 375 Techniques in Environmental Science (3 cr.) |
| BIOL-490 Individual Study (1-4 cr.) | SPEA-E 400 Topics in Environmental Studies (Approved to 6 cr.) |
| BIOL-M 250 Microbiology (3 cr.) | SPEA-E 410 Introduction to Environmental Toxicology (3 cr.) |
| BIOL-M 315 Microbiology Laboratory (2 cr.) | SPEA-E 411 Introduction to Groundwater Hydrology (3 cr.) |
| BIOL-M 465 Environmental Microbiology Laboratory (3 cr.) | SPEA-E 418 Vector-based GIS (3 cr.) or GEOG-G 338 GIS (3 cr.) |
| BIOL-Z 374 Invertebrate Zoology (3 cr.) | SPEA-E 419 Applied Remote Sensing of the Environment (3 cr.) or GEOG-G 336 Environmental Remote Sensing (3 cr.) |
| BIOL-Z 375 Invertebrate Zoology Laboratory (2 cr.) | SPEA-E 426 Applied Math for Environmental Science (3 cr.) |
| BIOL-Z 476 Biology of Fishes (3 cr.) | SPEA-E 431 Water Supply and Wastewater Treatment (3 cr.) |
| CHEM-A 314 Biological and Environmental Chemical Analysis (2 cr.) | SPEA-E 440 Wetlands: Biology and Regulation (3 cr.) |
| CHEM-A 316 Bioanalytical Chemistry Laboratory (2 cr.) | SPEA-E 441 Habitat Analysis—Terrestrial (3 cr.) |
| CHEM-C 317 Equilibria and Electrochemistry (2 cr.) | SPEA-E 442 Habitat Analysis—Aquatic (3 cr.) |
| CHEM-C 318 Spectrochemistry and Separations (2 cr.) | SPEA-E 443 Habitat Analysis—Aquatic (3 cr.) |
| GEOG-G 304 Physical Climatology (3 cr.) | SPEA-E 451 Habitat Analysis—Aquatic (3 cr.) |
| GEOG-G 305 Environmental Change – Nature and Impact (3 cr.) | SPEA-E 452 Habitat Analysis—Aquatic (3 cr.) |
| GEOG-G 307 Biogeography: The Distribution of Life (3 cr.) | SPEA-E 453 Habitat Analysis—Aquatic (3 cr.) |
| GEOG-G 341 Ecological Restoration: Science and Politics (3 cr.) | SPEA-E 460 Fisheries and Wildlife Management (3 cr.) |
| GEOG-G 350 Field Methods in Physical Geography (3 cr.) | SPEA-E 461 Fisheries and Wildlife Management Laboratory (3 cr.) |
| GEOG-G 405 Ecological Climatology (3 cr.) | SPEA-E 464 Organic Pollutants: Environmental Chemistry and Fate (3 cr.) |
| GEOG-G 436 Advanced Remote Sensing: Aquatic (3 cr.) | SPEA-E 490 Directed Research in Environmental Science (1-4 cr.) |
| GEOG-G 437 Advanced Geographic Information Science (3 cr.) | Or other courses in environmental science approved by the BSES Program Directors |

**FIELD EXPERIENCE (5-6cr)** Courses used to satisfy the Field Experience Requirement cannot be used to satisfy any other degree requirement.
- One of the following options:
  - One field experience:
    - GEOG-G 329 Introductory Field Experience in Environmental Science (5-6cr)
    - GEOG-G 433 Geology, Hydrology and Geochemistry in the Rocky Mountains (6cr)
    - Course at an approved field station (consult the BSES Program Chair prior to attending the field station)
  - Two of the following courses:
    - BIO-L 465 Advanced Field Biology (3cr) (P: BIO-L 473 or equivalent and consent of instructor)
    - GEOG-G 350 Field Methods in Physical Geography (3cr) (P: One of GEOG-G 107, G 109, G 185, G 208; or consent of instructor)
    - SPEA-E 442 Habitat Analysis—Terrestrial (3cr)
    - SPEA-E 443 Habitat Analysis—Aquatic (3cr)