

# COURSE CHECKLIST FOR THE MAJOR IN BIOLOGY with a CONCENTRATION IN ECOLOGY AND ENVIRONMENTAL BIOLOGY

## FOR THOSE ENTERING UNDER THE 2010-11 CATALOG

<http://www.jmu.edu/catalog/10/programs/biology.html#concentration>

For those interested in pursuing a concentration in Ecology & Environmental Biology,  
please contact Dr. Bruce Wiggins ([wigginba@jmu.edu](mailto:wigginba@jmu.edu))

Students must complete a minimum of 40 BIO credit hours, with at least 24 credit hours at the 300 level or above.

### BIOLOGY CORE

Check when met:

- BIO 114. Organisms
- BIO 124. Ecology and Evolution
- BIO 214. Cell and Molecular Biology
- BIO 224. Genetics and Development

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### COGNATES

*Chemistry* - complete all of the following courses

- CHEM 131/CHEM 131L + CHEM 132/CHEM 132L
- CHEM 341 + CHEM 342 + CHEM 346L

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*Physics* - complete one of the following sequences

- PHYS 125/126 OR PHYS 140/140L + PHYS 150/150L

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*Calculus* - complete one course (or courses sequence)

- MATH 231 + MATH 232 OR MATH 235

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*Statistics* - complete one course

- MATH 220 OR MATH 285 OR MATH 318

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*Advanced Statistics* - complete one course

- MATH 321 OR BIO 454

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*Geographic Information Systems* - complete one course

- GEOG 366 OR BIO 457

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### UPPER DIVISION BIOLOGY

- Students must complete at least 24 credit hours from the list on the following page. At least one of these must be an organismal diversity course, and at least two must be laboratory/field courses.
- Individual courses may satisfy more than one requirement.
- With **prior approval** from the concentration coordinator, BIO 426 and/or BIO 427 may be substituted.
- Students are strongly encouraged to discuss their career interests with an advisor who can help select courses best suited to their needs.
- Students are encouraged to participate in independent research with a faculty mentor. In addition to the courses listed below, a maximum of eight credits of BIO 495, 496, 497, 499 and ISCI 450 can be counted toward the Biology/EEB concentration.

**UPPER DIVISION** (continued)

- BIO 305. Ornithology<sup>1, 2</sup>
- BIO 310. General Entomology<sup>1, 2</sup>
- BIO 320. Comparative Anatomy of Vertebrates<sup>1, 2</sup>
- BIO 340. Morphology and Anatomy of Vascular Plants<sup>1, 2</sup>
- BIO/MATH 342. Mathematical Models in Biology
- BIO 345. Animal Field Biology<sup>1, 2</sup>
- BIO 354. Global Climate Change and Life
- BIO 360. Plant Biology<sup>1</sup>
- BIO 370. Animal Physiology<sup>2</sup>
- BIO 380. General Microbiology<sup>1, 2</sup>
- BIO 386. Field Botany<sup>1, 2</sup>
- BIO/PSYC 395. Comparative Animal Behavior
- BIO 403. Animal Communication<sup>2</sup>
- BIO 404. Evolutionary Analysis
- BIO 409. Marine and Freshwater Invertebrates<sup>1</sup>
- BIO 412. Mammalogy<sup>1, 2</sup>
- BIO 451. Ecological Systems<sup>2</sup>
- BIO 452. Population Ecology<sup>2</sup>
- BIO 453. Microbial Ecology and Evolution
- BIO 454. Introduction to Biometrics
- BIO 455. Plant Physiology<sup>2</sup>
- BIO 456. Landscape Ecology
- BIO 457. Biological Applications of Geographic Information Systems<sup>2</sup>
- BIO 459. Freshwater Ecology<sup>2</sup>
- BIO 465. Environmental Toxicology<sup>2</sup>
- BIO 466. Toxicology Seminar
- BIO 470. Morphology of Nonvascular Plants<sup>1, 2</sup>
- BIO 486. Systematics of Vascular Plants<sup>1, 2</sup>

<sup>1</sup> meets the organismal diversity course requirement

<sup>2</sup> meets the laboratory/field course requirement

**Note:** It is highly recommended that students take additional upper-level degree elective courses in geography/GIS (such as GEOG 466, GIS & Geographic Databases, or GEOG 467, GIS Project Management) and in statistics (such as MATH 322, Applied Linear Regression, or MATH 324, Applied Nonparametric Statistics). Students should consult with their adviser about which courses are appropriate.

List upper-division Biology courses as you take them. You must have at least 24 credit hours:

Course / credit hours

Course / credit hours

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**Note:** The JMU Undergraduate Catalog is the official listing of requirements and takes precedence over this guide, in case of conflicts.