Biology

Richard Mayden, Ph.D., Chair
John C. Kennell, Ph.D., Associate Chair

Full-time Faculty:
Robert D. Aldridge, Ph.D
Nevin Aspwinwall, Ph.D
Janet C. Barber, Ph.D
Peter Bernhardt, Ph.D
Barrie Bode, Ph.D
Gerardo R. Camillo, Ph.D
Brian P. Downes, Ph.D
Stephen J. Dina, Ph.D
Jonathan S. Fisher, Ph.D
Joseph C. Fortier, S.J., Ph.D
Jason Knouft, Ph.D
Wesley J. Leverich, Ph.D
Allison Miller, Ph.D
Shawn E. Nordell, Ph.D
Judith Mosinger Ogilvie, Ph.D
Laurie K. Russell, Ph.D
Donald Schreiweis, Ph.D
John G. Severson, Jr., Ph.D
Laurie Shornick, Ph.D
Susan A. Spencer, Ph.D
William S. Stark, Ph.D
Thomas J. Valone, Ph.D
Yuqi Wang, Ph.D
Robert M. Wood, Ph.D
Wenyan Xiao, Ph.D

Laboratory Coordinators
Amber Reece, MS
Christine Simmons, MS

Associated Faculty:
Missouri Botanical Garden
Thomas B. Croat, Ph.D
Peter Goldbatt, Ph.D
Peter Raven, Ph.D
Mick Richardson, Ph.D

St. Louis Zoological Park
Cheryl S. Asa, Ph.D
Joan E. Bauman, Ph.D
The undergraduate curricula in the Department of Biology are diverse and will meet a variety of student-related interests in the rapidly expanding fields of the biological sciences. It is also designed to provide a broad but intensive educational experience for students in other disciplines who have an interest in biology. The department offers both undergraduate and graduate degrees. Students who pursue either a major or minor in biology should be aware of the following requirements.

1. A student must have at least a 2.00 cumulative average in prerequisite(s) for upper division courses in Biology. These are BIOL 104, BIOL 106 (8 credit hours); CHEM 163, CHEM 165, CHEM 164, and CHEM 166 (8 credit hours).

2. In addition to the standard 12 upper-division hour Biology Core requirement for B.A and B.S. degree programs, a maximum of 3 and 4 semester hours, respectively, of research (BIOL 498: Advanced Independent Study) can be included in the 13 and 23 upper-division Biology Elective hour requirement.

3. In accordance with Arts and Sciences graduation requirements, a student must earn an overall 2.00 grade point average in all major and minor (certificate or related) courses that are approved for completion of their degree program.

Field Station at Saint Louis University

The University’s Reis Biological Station is operated by the Department of Biology to promote environmental and biological education and research. The Reis Biological Station is located on the Huzzah Creek in the Ozarks near Steelville, MO. and has 225 acres of upland, oak-hickory forest. The field station has a variety of aquatic and terrestrial communities and has well-equipped research and teaching laboratories, kitchens, dormitories, and housing for visiting scientists. Summer classes are offered and the station is used for faculty and student research. These facilities are also used for a variety of special programs—conferences, training programs, workshops and retreats.
Biology (B.A.)

**Required Biology Courses**
- Evolutionary Biology (BIOL 301) ………………………………………..3
- Principles of Genetics (BIOL 303) ………………………………………..3
- Molecular Cell Biology I (BIOL 302)………………………………………..3
- Molecular Cell Biology II (BIOL 304)………………………………………..3

A minimum of 25 upper-division credit hours in Biology is required, and at least one plant science course from the following list is required: Biology of Plants and Fungi (BIOL326), Ethnobotany (BIOL328), Plant Physiology (BIOL349), Pollination Biology (BIOL404), Plant Ecology (BIOL409), Biology and Classification of Orchids (BIOL421), Spring Flora of Ozarks (BIOL433), and Plant Biochemistry (BIOL476) or an equivalent plant science course approved by the Department. One structured laboratory course or a 4 or 5 credit lecture/laboratory course component is required. Note: BIOL 484, 488, 489, or 498 do not count as structured laboratory courses.

**Required related courses**
- Principles of Organic Chemistry (CHEM 342, 343, 344, 345 or equivalent)……………………………….8
- Pre-Calculus (MATH 141)…………………………………………………..3

**Recommended related courses**
- General Physics (PHYS 131)…………………………………………….3
- General Physics II (PHYS 133)…………………………………………..3
- Calculus (MATH 142)……………………………………………………..4
- Statistics (one semester)………………………………………………….3

**Typical Course of Study**
It is recognized that the particular needs and interests of individual students vary widely. The accompanying typical course of study is intended to serve as a model around which a student may construct his or her own program. Indicated below are Core and Biology degree requirements in a sample four year course of study.

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td><strong>FRESHMAN YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>BIOL 104</td>
<td>(4)</td>
</tr>
<tr>
<td>CHEM163/165</td>
<td>(4)</td>
</tr>
<tr>
<td>MATH 120 or MATH 141</td>
<td>(3)</td>
</tr>
<tr>
<td>Core: ENGL 190</td>
<td>(3)</td>
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<tr>
<td>Core: Foreign Language</td>
<td>(3)</td>
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<tr>
<td>17</td>
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</tbody>
</table>

**SOPHOMORE YEAR**
Minimum total hours required for Graduation: 120

* An approved computer language course may satisfy 3 hours of the foreign language requirement.

** Electives recommended include General Physics 1 and 2, Calculus 1 and Statistics.

** Biology (B.S.)

** Required Biology Courses:
- Evolutionary Biology (BIOL 301).................................3
- Principles of Genetics (BIOL 303).................................3
- Molecular Cell Biology I (BIOL 302)...............................3
- Molecular Cell Biology II (BIOL 304).............................3

A minimum of 35 upper-division hours of biology is required. In addition, one of four Senior Inquiry (0 – 4 credits) options is also required. All B.S. students must take at least 10 credit hours from two categories (A and B below), including at least one plant science course from the following list: Biology of Plants and Fungi (BIOL326), Ethnobotany (BIOL328), Plant Physiology (BIOL349), Pollination Biology (BIOL404), Plant Ecology (BIOL409), Biology and Classification of Orchids (BIOL421), Spring Flora of the Ozarks (BIOL433), Plant Biochemistry (BIOL476), or an equivalent plant science course approved by the Department.
B.S. students must also have at least three structured laboratory experiences (i.e. laboratory courses or 4 or 5 credit lecture/laboratory course) with at least one from category A and one from category B (see below). Note: BIOL 484, 488, 489 or 498 do not count as structured laboratory courses.

A. Cellular, Molecular and Developmental Biology
Cell Laboratory (BIOL306)
Genetics Laboratory (BIOL310)
Experimental Cell Biology (BIOL312)
Comparative Anatomy (BIOL342)
Physiology Laboratory (BIOL347)
Embryology (BIOL344)
Vertebrate Reproductive Physiology (BIOL402)
Nerve Cell Mechanisms in Behavior (BIOL415)
Comparative Animal Physiology (BIOL441)
Vertebrate Histology (BIOL444)
Exercise Physiology (BIOL446)
Electron Microscopy (BIOL447)
Introductory Endocrinology (BIOL450)
Behavioral Endocrinology (BIOL451)
Human Cellular Physiology (BIOL454)
Biology of Aging (BIOL455)
Developmental Biology (BIOL460)
Developmental Biology Laboratory (BIOL461)
Immunobiology (BIOL463)
Microbiology (BIOL464)
Microbiology Laboratory (BIOL465)
Molecular Biology (BIOL470)
Plant Biochemistry (BIOL476)

B. Ecology, Evolutionary and Organismal Biology
Biology of Invertebrates (BIOL322)
Sex, Evolution and Behavior (BIOL401)
Structure and Function of Ecosystems (BIOL406)
Natural History of Vertebrates (BIOL410)
Aquatic Ecology (BIOL420)
General and Medical Entomology (BIOL424)
Biology of Amphibians and Reptiles (BIOL426)
Biology of Fishes (BIOL428)
Biology of Birds (BIOL431)
Cave Biology (BIOL432)
Systematic Biology (BIOL434)
Biology of Parasitic Organisms (BIOL435)
Animal Behavior (BIOL436)
Animal Behavior Laboratory (BIOL437)
Biology of Mammals (BIOL438)
Applied Ecology (BIOL440)
Ecological Risk Assessment (BIOL445)
Conservation Biology (BIOL448)
Population Biology (BIOL467)
Landscape Ecology (BIOL468)
General Ecology (BIOL475)

Senior Inquiry Options include:
BIOL 484 Library Project and Thesis...........................................1-4
BIOL 485 Graduate Level Course in Biology.................................1-4
BIOL 488 Research Project..........................................................1-4
BIOL 489 Comprehensive Examination.......................................0

Required related courses:
Principles of Organic Chemistry I and II.................................8
(CHEM 342, 344, and 343, 345, or equivalent)
General Physics I and II (PHYS131 and 133)..............................6
Calculus I (MATH 142)..............................................................4
Statistics (RMET410, PSYA306, or BIOL479).............................3-4

Reduced College Core Requirements
Students pursuing a B.S. degree are eligible to reduce the number of credit hours in Philosophy
(from 9 to 6), Theology (from 9 to 6), English Literature (from 6 to 3), and Language (from 9 to 6).
Note: Students that drop out of the B.S. degree program and seek a B.A. must fulfill the standard set
of college core requirements.

Typical Course of Study
It is recognized that the particular needs and interests of individual students vary widely. The
accompanying typical course of study is intended to serve as a model around which a student may
conduct his or her own program. Indicated below are the Core and Biology degree requirements in
a sample four-year course of study.

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<tr>
<th></th>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>FRESHMAN YEAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 104</td>
<td>(4)</td>
<td>BIOL 106</td>
</tr>
<tr>
<td>CHEM 163/165</td>
<td>(4)</td>
<td>CHEM 164/166</td>
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<tr>
<td>MATH 142</td>
<td>(4)</td>
<td>Core: Social Science</td>
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<tr>
<td>Core: ENGL 190</td>
<td>(3)</td>
<td>Core: ENGL 300 level</td>
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<tr>
<td>Core: Foreign Language</td>
<td>Core: Foreign Language</td>
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<td>18</td>
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**SOPHOMORE YEAR**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
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<td>BIOL 302</td>
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<tr>
<td>BIOL 304</td>
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</tr>
<tr>
<td>CHEM 342, 344</td>
<td>(4)</td>
</tr>
<tr>
<td>CHEM 343, 345</td>
<td>(4)</td>
</tr>
<tr>
<td>RMET 410 or BIOL 479</td>
<td>(3, 4)</td>
</tr>
<tr>
<td>Core: Social Science</td>
<td>(3)</td>
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<tr>
<td>Core: PHIL 105</td>
<td>(3)</td>
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<tr>
<td>Core: PHIL 205</td>
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<tr>
<td>Core: HIST 111</td>
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<tr>
<td>Core: HIST 112</td>
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**JUNIOR YEAR**

<table>
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<th>Course</th>
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<tbody>
<tr>
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<tr>
<td>BIOL 301</td>
<td>(3)</td>
</tr>
<tr>
<td>BIOL 300/400 level</td>
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<tr>
<td>Plant Biology Elective</td>
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<tr>
<td>PHYS 131</td>
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<tr>
<td>PHYS 133</td>
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<td>Core: THEO 100</td>
<td>(3)</td>
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<tr>
<td>Core: THEO 200 level</td>
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<tr>
<td>Elective</td>
<td>(3)</td>
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<tr>
<td>Core: Fine Arts</td>
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**SENIOR YEAR**

<table>
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<th>Course</th>
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<tbody>
<tr>
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<td>BIOL 495</td>
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<td>Elective**</td>
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**Minimum total hours required for Graduation:** 120

**MINOR**

A minor in Biology may be obtained by students who complete the following prerequisite courses: BIOL 104 and 106 or equivalents (8 credits) and CHEM 163/165 and 164/166 or equivalents (8 credits), and a minimum of 12 credits of upper-division Biology electives selected from BIOL 301 through 479. For all courses taken as part of the minor, a student must have earned at least a 2.00 grade point average.