Biology 479
Cover Page

Student’s Name: ________________________________
Student’s Royal ID: ________________________________
Student’s Academic Advisor: ________________________________
List of attached supporting documentation:

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Student’s signature                                                    Date

__________________________________________________________  ____________________________
Advisor’s signature                                                    Date

__________________________________________________________  ____________________________
Biology Chair’s signature                                              Date
1. **Demonstrate mastery of content across the broad field of modern biology**

*Biology majors are required to take the two-semester general biology course with laboratories (BIOL 141-BIOL 142 with labs). In addition to this 9-credit sequence, biology majors will select a minimum of 27 credits of biology electives, with at least four credits in courses at the 200-level or higher that deal primarily with phenomena in each of the three subject areas listed below and a minimum of three laboratory courses.*

- **BIOL 141 and 141L**
- **BIOL 142 and 142L**

**Total Credit Count from all courses below (must be at least 27 credits): _______

Credit count for each course is indicated in parentheses**

### MC □ Molecular & Cellular Elective (minimum of 4 credits) CREDIT COUNT ______

- □ BIOL 250 - Microbiology (3)
- □ BIOL250L - Microbiology Lab (2)
- □ BIOL 260 - Genetics (3)
- □ BIOL 260L - Genetics Lab (1.5)
- □ BIOL 344 - Immunology (3)
- □ BIOL 344L - Immunology Lab (1.5)
- □ BIOL 350 - Cellular Biology (3)
- □ BIOL 350L - Cellular Biology Lab (2)
- □ BIOL 358 - Cellular and Molecular Neurobiology (3)
- □ BIOL 361- Molecular Biology I (3)
- □ BIOL 361L - Molecular Biol. I Lab (2)
- □ BIOL 362 - Molecular Biology II (3)
- □ BIOL 362L - Molecular Biol. II Lab (2)
- □ BIOL 364 - Virology (3)
- □ BIOL 464 - Molecular Biology of Cancer (3)

### S □ Systems Electives (minimum of 4 credits) CREDIT COUNT ______

- □ BIOL 241 - Comparative Vertebrate Anatomy (3)
- □ BIOL 241L - Comparative Vertebrate Anatomy Lab (2)
- □ BIOL 245 - General Physiology (3)
- □ BIOL 245L - General Physiology Lab (1.5)
- □ BIOL 255 - Animal Nutrition and Metabolism (3)
- □ BIOL 272 - Invertebrate Biology (3)
- □ BIOL 272L - Invertebrate Biology Lab (2)
- □ BIOL 342 - Comparative Biomechanics (4)
- □ BIOL 345 - Comparative Animal Physiology (3)
- □ BIOL 346 - Endocrinology and Reproduction (3)
- □ BIOL 347 - Exercise Physiology (3)
- □ BIOL 348 - Functional Neuroanatomy (3)
- □ BIOL 349- Plant Physiology (3)
- □ BIOL 349L - Plant Physiology Lab(2)
- □ BIOL 351- Developmental Biology (3)
- □ BIOL 351L - Developmental Biol Lab (2)
- □ BIOL 352- Histology (3)
- □ BIOL 352L - Histology Lab (2)
- □ BIOL 354 - Special Histology (3)
- □ BIOL 354L - Special Histology Lab(2)
- □ BIOL 395 - Extreme Physiology (3)
- □ BIOL 444 - Sensory Biology (3)
- □ BIOL 446 - Cardiovascular Physiology (3)
- □ BIOL 453 - Skeletal Biology (3)
- □ BIOL 454 - Pathophysiology (3)
MO □ Multi-Organismal Electives (minimum of 4 credits) CREDIT COUNT _____

- BIOL 273 - Marine Ecology (3)
- BIOL 274 - Conservation Biology (3)
- BIOL 27X - Entomology (3)
- BIOL 27XL - Entomology Lab (1.5)
- BIOL 295 - Philippines Organisms and Ecosystems (3)
- BIOL 360 - Molecular Evolution and Bioinformatics (3)
- BIOL 368 - Neuroethology (4)
- BIOL 370 - Animal Behavior (3)
- BIOL 370 - Animal Behavior Lab (1.5)
- BIOL 371 - Ecology (3)
- BIOL 371L - Ecology Lab (2)
- BIOL 374 - Vertebrate Biology (3)
- BIOL 374L - Vertebrate Biology (2)
- BIOL 375 - Evolution (3)
- BIOL 472 - Systems Ecology (3)
- BIOL 473 - Estuarine Ecology (3)
- BIOL 473L - Estuarine Ecology Lab (2)

Major Electives (in addition to courses checked above)
Fill in the box below and write the total credit count here: _____

Write down the courses that count towards the major electives. Courses must be BIOL.

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<th>Course</th>
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2. Laboratory Expertise

Biology majors must have three laboratory course experiences at the 200 level or above from at least two of the three content areas (Molecular/Cellular, Systems, and Multi-organismal). At least one course should be a laboratory course that incorporates manipulation of tissue or whole organisms at the macroscopic level. Students should consult the department’s website and their advisors for the lists of courses that fulfill these requirements.

NOTE: One of the labs can be substituted by only one of the following laboratory experiences; supporting documentation must be attached:
- a. Successfully defended an Honors Thesis (BIOL 488H/489H) involving research that generated original data.
- b. Successfully completed a fellowship or internship for summer research in a life science-related project.
- c. Successfully completed Independent Research (BIOL 393 or BIOL 394).

Check ALL boxes below:

☐ Whole organism manipulation lab ________________________________

   Content Area: MC _____ S_____ MO ______

   Courses include Biol 241L, 272L, 342, 349L, 351L, 368, 370L, 371L

☐ Lab experience 2 ________________________________

   Content Area: MC _____ S_____ MO ______

☐ Lab experience 3 ________________________________

   Content Area: MC _____ S_____ MO ______
3. Critically evaluate biological data (two courses or experiences)

Students must gain expertise in acquiring data either first-hand or from primary literature sources, and in evaluating and interpreting the data. Activities include: literature searches, data analysis and synthesis, and graphical representation of data.

Check ANY TWO boxes below:

Courses approved by the department that fulfill this requirement.

- BIOL 245L General Physiology Lab
- BIOL 272L Invertebrate Biology Lab
- BIOL 273 Marine Ecology
- BIOL 342 Comparative Biomechanics
- BIOL 349L Plant Physiology Lab
- BIOL 350L Cellular Biology Lab
- BIOL 351L Developmental Biol. Lab
- BIOL 368 Neuroethology
- BIOL 370L Animal Behavior Lab
- BIOL 371L Ecology Lab
- BIOL 374L Vertebrate Biology Lab
- BIOL 379 Biostatistics
- BIOL 446 Cardiovascular Physiology

- Successfully defended an Honors Thesis (BIOL 488H/489H) that generates original data (attach documentation).
- Successfully completed a project awarded a Fellowship for Summer Research in a life science-related project that generates original data (attach documentation).
- Successfully completed Independent Research (BIOL 393 or BIOL 394) that generates original data (attach documentation).
- Served as an author of an article that includes original data and is submitted for publication to a peer-reviewed journal (attach documentation).
4. Demonstrate mastery of the scientific method

This experience would ordinarily be demonstrated by activities involving independent investigation or experimental design. The experimental design must employ the scientific method, which includes designing a hypothesis and protocol, gathering data, interpreting results, developing conclusions, and formulating future directions for further investigation.

Check ANY ONE box below:

Courses approved by the department that fulfill this requirement.

- BIOL 272L Invertebrate Biology Lab
- BIOL 342 Comparative Biomechanics
- BIOL 349L Plant Physiology Lab
- BIOL 350L Cellular Biology Lab
- BIOL 351L Developmental Biology Lab
- BIOL 368 Neuroethology
- BIOL 370L Animal Behavior Lab

- Successfully defended an Honors Thesis (BIOL 488H/489H) that incorporated the scientific method *(attach documentation)*.

- Successfully completed a project awarded a Fellowship for Summer Research in a life science-related project that incorporates the scientific method *(attach documentation)*

- Successfully completed Independent Research (BIOL 393 or BIOL 394) that incorporates the scientific method *(attach documentation)*.

- Served as an author of an article that incorporates the scientific method and is submitted for publication to a peer-reviewed journal *(attach documentation)*.

- Presented a project at the Biology Department Fall or Spring Student Conference that incorporates the scientific method as described above *(attach documentation)*.
5. Effectively communicate biological information in writing

These experiences ordinarily include a written product in which a majority of the citations come from the primary literature or that incorporates original data.

Check ANY TWO of the boxes below

Courses approved by the department that fulfill this requirement.

| ☐ BIOL 250L Microbiology Lab | ☐ BIOL 358 Cellular and Molecular Neurobiology |
| ☐ BIOL 272 Invertebrate Biology | ☐ BIOL 362L Molecular Biology II Lab |
| ☐ BIOL 273 Marine Ecology | ☐ BIOL 368 Neuroethology |
| ☐ BIOL 342 Comparative Biomechanics | ☐ BIOL 370 Animal Behavior |
| ☐ BIOL 350L Cellular Biology Lab | ☐ BIOL 371L Ecology Lab |
| ☐ BIOL 351L Developmental Biol. Lab | ☐ BIOL 374L Vertebrate Biology Lab |

☐ Worked with a faculty mentor, produce a written project, either in a class or independently *(attach documentation).*
Courses that offer optional written projects include but are not limited to:
- Biol 371 – Ecology
- Biol 374 – Vertebrate Biology

☐ Successfully defended an Honors Thesis (BIOL 488H/489H) that generated original data. *(attach documentation)*

☐ Served as an author of an article that is submitted for publication to a peer-reviewed journal *(attach documentation).*

☐ Served as first author of a poster presented at a scientific conference (requires evidence that the abstract was published in the conference program or website, *attach documentation*).
6. Effectively communicate biological information orally

These experiences ordinarily demonstrate that the student has read the primary literature and/or analyzed original data. The oral presentation should be at least 10 minutes long.

Check ANY TWO of the boxes below:

Courses approved by the department that fulfill this requirement.

| BIOL 272L Invertebrate Biology Lab | BIOL 358 Cellular and Molecular Neurobiology |
| BIOL 342 Comparative Biomechanics | BIOL 368 Neuroethology |
| BIOL 344L Immunology Lab | BIOL 444 Sensory Biology |
| BIOL 351L Developmental Biology Lab | BIOL 446 Cardiovascular Physiology |
| BIOL 352 Histology | BIOL 453 Skeletal Biology |

- Successfully defended an Honors Thesis (BIOL 488H/489H) that generated original data.
- Made an oral presentation at an extramural scientific conference (requires evidence that the abstract was published in the conference program or website, attach documentation).
- Made a poster presentation as PRIMARY or PRESENTING AUTHOR at an extramural scientific conference (requires evidence that the abstract was published in the conference program or website, attach documentation). Note: second authorship of a poster does NOT qualify.
- Made an oral or poster presentation at the Annual Celebration of Student Scholars or an equivalent on-campus forum (attach documentation).
- With the approval of the instructor, made an oral presentation in a class that might not ordinarily require an oral presentation (attach documentation).
- Made an oral presentation at the Biology Department Fall or Spring Student Conference (attach documentation).