Biology 479 – Biology Portfolio Checklist
Version F19 – For Students Matriculating in AY 2019-20

Student's Name: _____

Student's Royal ID: _____

Student's Academic Advisor: _____

Introduction

While classrooms provide an essential site for the delivery, discussion, and integration of content and competencies related to biological science education, learning can also take place in a variety of venues. The goal of this Portfolio Checklist is to guarantee that students use these alternate avenues for intellectual and professional development. This program is designed to provide concrete guidelines for implementing student engagement in a variety of learning activities that will ensure that their undergraduate education will consist of both curricular and extracurricular activity. In addition, the Portfolio Checklist provides the department with a way to track the progress of students and to implement assessment mechanisms to improve our major.

BIOL 479 is a required, zero-credit course for which each Biology major must register and receive a satisfactory grade (of S) as a necessary part of completing the requirements for the Biology degree. Typically, the student registers for BIOL 479 in their final semester. A satisfactory grade in BIOL 479 is achieved by documenting, in consultation with the student's Academic Advisor, successful completion of the six Programmatic Learning Outcomes that are listed and described on the following pages. Upon completion of the Portfolio Checklist, both the student and the Advisor must sign this checklist, attach supporting documentation, and submit the Portfolio Checklist to the Biology Chair, who will verify its successful completion and assign the grade for BIOL 479.

The student should review progress on completion of the Portfolio Checklist at each semester's preregistration advising meeting to ensure that a successful plan for its completion is in place.

List of attached supporting documentation:

Current version of CAPP sheet *must be attached to submitted Checklist*

1. _____ **4.** _____

2. _____ **5.** _____

3. _____ **6.** _____

Student's Post-graduation Plans _____

_____ _____

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 141-142 and BIOL 141L-142L). 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 *content areas* listed below.

☐ 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 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 346 - Endocrinol. & Reproduct. (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 357 - Develop. Neuroscience (4)
- ☐ 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 295 - Philippines Organisms and Ecosystems (3)
- ☐ BIOL 360 - Molecular Evolution and Bioinformatics (3)
- ☐ BIOL 368 - Neuroethology (4)
- ☐ BIOL 370 - Animal Behavior (3)
- ☐ BIOL 370L - Animal Behavior Lab (2)
- ☐ BIOL 371 - Ecology (3)
- ☐ BIOL 371L - Ecology Lab (2)
- ☐ BIOL 374 - Vertebrate Biology (3)
- ☐ BIOL 374L - Vertebrate Biology Lab (2)
- ☐ BIOL 375 - Evolution (3)
- ☐ BIOL 473 - Estuarine Ecology (3)

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.

Course	Credits

2. Gain Laboratory Expertise ☐

Because hands-on experiences are at the core of the scientific method and enhance active learning, biology majors must pass *three laboratory courses* at the 200 level or above from at least two of the three content areas. To help students appreciate the integration and complexity of life from the cellular to the organismal or ecosystem level, *at least one course must be a laboratory course that incorporates manipulation of tissue or whole organisms at the macroscopic level.*

Check THREE 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 _____

Alternatively, one of the following may be substituted for only one of the laboratory experiences; **supporting documentation**, such as a paper or report written by the student, slides from an oral presentation authored or co-authored by the student, a poster authored or co-authored by the student, or a letter from the mentor summarizing the experience, **must be attached**.

☐ Defend an Honors thesis (BIOL 488H/489H) involving research that generates original data.

☐ Complete a fellowship or internship for summer research in a life science-related project.

☐ Complete Undergraduate Research (BIOL 393 or BIOL 394).

3. Critically evaluate biological data ☐

The advancement of biological inquiry depends upon the critical analysis and evaluation of biological data. Students must gain expertise in acquiring data either first-hand, from primary literature sources, or from bioinformatics databases, and in analyzing, evaluating, and interpreting the data.

Biology majors must pass two courses at the 200 level or above that satisfy this requirement.

Check ANY TWO boxes below:

Courses approved by the department that fulfill this requirement.

☐ BIOL 245L General Physiology Lab	☐ BIOL 368 Neuroethology
☐ BIOL 272L Invertebrate Biology Lab	☐ BIOL 370L Animal Behavior Lab
☐ BIOL 273 Marine Ecology	☐ BIOL 371L Ecology Lab
☐ BIOL 342 Comparative Biomechanics	☐ BIOL 374L Vertebrate Biology Lab
☐ BIOL 349 Plant Physiology (S19)	☐ BIOL 379 Biostatistics
☐ BIOL 349L Plant Physiology Lab	☐ BIOL 395 Extreme Physiology (I19)
☐ BIOL 350L Cellular Biology Lab	☐ BIOL 446 Cardiovascular Physiology
☐ BIOL 351L Developmental Biol. Lab	

Alternatively, one of the following can be substituted for only one of the required courses that fulfill this experience; **supporting documentation**, such as a paper or report written by the student, slides from an oral presentation authored or co-authored by the student, a poster authored or co-authored by the student, or a letter from the mentor summarizing the experience, **must be attached**.

☐ Defend an Honors thesis (BIOL 488H/489H) that involves analysis, evaluation, and interpretation of data.

☐ Complete a fellowship or internship for summer research in a life science-related project that involves the analysis, evaluation, and interpretation of data.

☐ Complete a faculty-directed research project of at least one semester in duration that involves the analysis, evaluation, and interpretation of data.

4. Demonstrate mastery of the scientific method ☐

The advancement of biological inquiry also depends upon the proper execution of the scientific method. This experience would ordinarily be demonstrated by activities involving experimental design. The experimental design must employ the scientific method, which includes designing a hypothesis and protocol, gathering data, analyzing and interpreting results, developing conclusions, and formulating future directions for further investigation. Each student must be involved in all aspects of the scientific method.

This objective may be achieved by completing any one of the following:

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

For the following, **supporting documentation must be attached**.

- ☐ Defend an Honors thesis that incorporates all aspects of the scientific method, as affirmed by the research mentor.
- ☐ Complete a fellowship or internship for summer research in a life science-related project that incorporates all aspects of the scientific method.
- ☐ Complete a faculty-directed research project of at least one semester in duration that incorporates all aspects of the scientific method.

5. Effectively communicate biological information in writing ☐

Communication is essential for the scientific process. Writing is one effective way to communicate. Products that satisfy this requirement must be individually authored papers written in the style of an article for a scientific journal. The majority of citations must be from the primary literature.

Biology majors must pass two courses at the 200 level or above that satisfy this requirement.

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 370L Animal Behavior Lab (S19)
☐ BIOL 349L Plant Physiol. Lab (S19)	☐ BIOL 371L Ecology Lab
☐ BIOL 350L Cellular Biology Lab	☐ BIOL 374L Vertebrate Biology Lab
☐ BIOL 351L Developmental Biol. Lab	☐ BIOL 375 Evolution (S19)

Alternatively, one of the following can be substituted for only one of the required courses that fulfill this experience; **supporting documentation must be attached**.

☐ Defend an Honors thesis that satisfies the criteria listed above.

☐ Complete a fellowship or internship for research in a life science-related project that produces a document that satisfies the criteria listed above.

☐ Complete a faculty-directed research project of at least one semester in duration that produces a document that satisfies the criteria listed above.

☐ Co-author a manuscript with a mentor for which the mentor documents in a letter that the student made a substantial contribution to the writing.

☐ Complete a document that meets the above criteria either in a class or independently under the direction of a biology faculty mentor.

6. Effectively communicate biological information orally ☐

Communication is essential for the scientific process. Delivering an oral presentation is one effective way to communicate. Each student must give *two* oral presentations, each on a different topic. For each, they must speak for at least 10 minutes without relying heavily on reading from notes or slides to an audience of at least 5 individuals, one of whom must be the instructor of record.

Biology majors must pass two courses at the 200 level or above that satisfy this requirement.

Check ANY TWO of the boxes below:

Courses approved by the department that fulfill this requirement.

☐ BIOL 255 Animal Nutrition & Metab. (S19)	☐ BIOL 358 Cellular and Molecular Neurobiology
☐ BIOL 272L Invertebrate Biology Lab	☐ BIOL 368 Neuroethology
☐ BIOL 342 Comparative Biomechanics	☐ BIOL 395 Extreme Physiology (I19)
☐ BIOL 346 Endocrinol. & Reproduction (S18)	☐ BIOL 444 Sensory Biology
☐ BIOL 349 Plant Physiology (S19)	☐ BIOL 446 Cardiovascular Physiology
☐ BIOL 351L Developmental Biology Lab	☐ BIOL 453 Skeletal Biology
☐ BIOL 352 Histology	

Alternatively, one of the following can be substituted for only one of the required courses that fulfill this experience; **supporting documentation must be attached**.

☐ Defend an Honors thesis that satisfies the criteria listed above.

☐ Make a presentation that meets the above criteria either in a class or outside of class under the direction of a biology faculty mentor.