Evolution, Ecology, and Organismal Biology

WASC Assessment Plan for PhD Program

Learning Outcomes

Upon completion of the degree, Ph.D. Students will:

1. Obtain an education that is well rounded in evolution, ecology, and organismal biology. Each student will receive an educational experience that broadens their knowledge base outside of their own particular research area while deepening their knowledge within that area.

   **Approach:** Students will take a prescribed set of courses including an introductory course that concentrates on skills needed for success in graduate school and beyond (EEOB 400), a foundational course in one of the three research areas in EEOB (EEOB 210, EEOB 211, EEOB 216), and additional coursework and seminars as needed and in consultation with the student’s guidance committee.

   **Assessment:** Courses will use various evaluation instruments including graded assignments, in class and out of class examinations, and oral presentations.

2. Be able to (1) understand and critically evaluate primary literature, (2) integrate, synthesize, and conceptualize ideas and theories, (3) identify and evaluate novel and relevant research questions, (4) develop appropriate and effective research strategies, and (5) effectively communicate scientific concepts and information both orally and in writing.

   **Approach:** Students will be involved in a number of different activities including participation in seminar courses, program and departmental seminars and colloquia, preparation of research proposals, annotated literature reviews, journal clubs, and regularly scheduled lab meetings. Students will be supervised by a major professor and a dissertation committee that will consist of at least two other disciplinary faculty members. Students will be strongly encouraged to submit predoctoral fellowship proposals in their first two years in the program under the guidance of a faculty member. Participation in Biology 400 will introduce students to scientific writing including manuscript and grant proposal preparation. Students who are advanced to candidacy will present their research results annually to participants in the EEOB program at GradFest.

   **Assessment:** Graded assignments and examinations in formal courses that rely on students demonstrating knowledge of the primary literature. Success in passing a written comprehensive examination by the end of the second year and advancing to candidacy through an oral examination no later than the end of the student’s third year in the program. Annual evaluation of student progress by their guidance or dissertation committee and final review by the EEOB committee for continuing students.
Successful completion of the dissertation including a defense and presentation of the research project at a final seminar.

3. Be able to (1) apply appropriate, responsible, and ethical research methods, (2) evaluate, analyze, and interpret evidence, (3) convey findings clearly and effectively both orally and in writing, (4) identify natural extensions of their work including broader impacts, and (5) produce results that are publishable in scientific journals.

**Approach:** Students will practice best practices of scientific research under the guidance and mentorship of an initial guidance committee, a dissertation committee, and the major professor. Methodologies on the preparation and analysis of scientific data will be taught and evaluated through both formal courses and in the day-to-day practices of research laboratories. Students will present their research progress orally at program-sponsored seminars and events, scientific meetings, and through publications in scientific journals. Whenever appropriate, students will engage in extension activities including teaching in undergraduate courses and participation in outreach activities to the community.

**Assessment:** Graded assignments in relevant courses. Annual progress reports that are evaluated by the student’s advisory/dissertation committee and the EEOB committee for continuing students. Documented participation in meetings, seminars, and publications that include abstracts and papers in scientific journals.

4. Produce results in a reasonable time frame.

**Approach:** Students will be actively engaged in laboratory activities that include regular meetings and journal clubs. Students that are advanced to candidacy will present their research results annually to participants in the EEOB program at GradFest. Student progress will be evaluated annually by the student’s dissertation committee and by the EEOB committee for continuing students.

**Assessment:** Annual progress reports that are evaluated by the student’s advisory/dissertation committee and the EEOB committee for continuing students. Presentation of results at professional meetings and publication in scientific journals.

5. Learn to become effective and engaging teachers.

**Approach:** Students will successfully complete the Teaching Assistant Development Program (TADP) that is provided by the UCR graduate division. All students will participate as teaching assistants for at least three quarters prior to completing their degree under the supervision of disciplinary faculty members in each quarter that the students are engaged in teaching. Whenever possible, students will participate in the mentorship of undergraduates and junior graduate students in research laboratories. Students will become effective communicators through regular presentations at laboratory meetings, journal clubs, professional
meetings as well as at course-supported discussion and laboratory sections.

**Assessment:** Successful completion of all assignments in the TADP program. Undergraduate evaluations of teaching performance in discussion and laboratory sections. Participation in mentorship of students in research laboratories. Presentation of final research seminar and defense of the student’s dissertation.

6. Practice the ideals consistent with those of a professional research scientist and educator.

**Approach:** Students will be involved in activities associated with those of a professional research scientist and educator including participating in laboratory meetings, journal clubs, student mentoring, teaching in undergraduate courses, submission of grant proposals, and presenting data through oral and written formats. Through the mentorship of the major professor, students will engage in ethical practices consistent with the ideals of the profession. Students will be recognized for excellence in research and teaching through a variety of campus and professional mechanisms. Through research seminars and participation at professional meetings, students will engage with research scientists from other institutions.

**Assessment:** Students will present their research findings at the annual EEOB GradFest once they have advanced to candidacy. Students will present their research findings at professional meetings and through the publication of their work in scientific journals. On campus research awards will be given for the best presentations at GradFest and outstanding teaching performance will be recognized through departmental outstanding teaching assistant awards. Students will be nominated for research excellence through professional societies and meetings.

7. Be satisfied with their education as researchers and teachers.

**Approach:** Students will be active participants in the graduate program including planning for weekly seminars, GradFest, and membership in key committees. The Graduate handbook will be updated annually to reflect changes in the program that are informed by best practices related to student success. Courses will be modified, in part, through comments made by students in evaluations. Annual consultations are performed the EEOB Graduate Student Association (“BGSA”) by the Graduate Advisor for Continuing Students. Recommendations from those consultations will be implemented when appropriate that enhance the overall quality of the program.
Learning Outcomes

Upon completion of the degree, M.S. Students will:

1. Obtain an education that is well rounded in evolutionary biology, ecology, and organismal biology.
   
   **Approach:** Students will take a prescribed set of courses including an introductory course that concentrates on skills needed for success in graduate school and beyond (BIOL 400), coursework in at least two of the three research areas in EEOB, and additional coursework and seminars as needed and in consultation with the student's guidance committee.

   **Assessment:** Courses will use various evaluation instruments including graded assignments, in class and out of class examinations, and oral presentations.

2. Use a combination of data, theoretical principles, and methodological problems to solve problems.

   **Approach:** Students will be involved in a number of different activities including participation in seminar courses, program and departmental seminars and colloquia, preparation of research proposals, annotated literature reviews, journal clubs, and regularly scheduled lab meetings. Students will be supervised by a major professor and a thesis committee that will consist of at least two other disciplinary faculty members.

   **Assessment:** Graded assignments and examinations in formal courses that rely on students demonstrating knowledge of the primary literature.

3. Be able to (1) apply appropriate, responsible, and ethical research methods, (2) evaluate, analyze, and interpret evidence, (3) convey findings clearly and effectively both orally and in writing, and (4) produce results that are publishable in scientific journals.

   **Approach:** Students will practice best practices of scientific research under the guidance and mentorship of a thesis committee and a major professor.

   Methodologies on the preparation and analysis of scientific data will be taught and evaluated through both formal courses and in the day-to-day practices of research laboratories. Students will present their research progress orally at program-sponsored seminars and events, scientific meetings, and through publications in scientific journals.

   **Assessment:** Graded assignments in relevant courses. Annual progress reports that are evaluated by the student’s thesis committee and the EEOB committee for continuing students. Documented participation in meetings, seminars, and publications that include abstracts and papers in scientific journals. Successful completion of a written thesis.
4. Produce research results in a reasonable time frame.

   **Approach:** Students will be actively engaged in laboratory activities that include regular meetings and journal clubs. Student progress will be evaluated annually by the student’s thesis committee and by the EEOB committee for continuing students.

   **Assessment:** Annual progress reports that are evaluated by the student’s thesis committee and the EEOB committee for continuing students. Presentation of results at professional meetings and publication in scientific journals. Successful completion of a written thesis.

5. Practice the ideals consistent with those of a professional research scientist and educator.

   **Approach:** Students will be involved in activities associated with those of a professional research scientist and educator including participating in laboratory meetings, journal clubs, student mentoring, teaching in undergraduate courses, submission of grant proposals, and presenting data through oral and written formats. Through the mentorship of the major professor, students will engage in ethical practices consistent with the ideals of the profession.

   **Assessment:** Students will present their research findings at professional meetings and through the publication of their work in scientific journals. Students will be nominated for research excellence through professional societies and meetings.

6. Produce graduates that are satisfied with their education.

   **Approach:** Students will be active participants in the graduate program including planning for weekly seminars and membership in key committees. The Graduate handbook will be updated annually to reflect changes in the program that are informed by best practices related to student success. Courses will be modified, in part, through comments made by students in evaluations. Students will consult regularly with the Graduate Advisor for Continuing Students. Recommendations from those consultations will be implemented when appropriate that enhance the overall quality of the program.

   **Assessment:** The EEOB handbook will be updated and distributed annually both in written form (to new students) and online through the EEOB web page.

   Responses to student input will be made promptly and appropriate action will be made in a timely fashion consistent with the goals of the program.