Environmental Sciences

Assessment Plan for the PhD Program

Program Learning Outcomes

1. Students who graduate with a Ph.D. in Environmental Sciences from UCR will have comprehensive knowledge of factual information, theoretical principles, and methodological approaches in the core areas of their chosen academic track (see below). This should enable them to pursue either academic or non-academic careers that relate to their major discipline.

2. Students who graduate with a Ph.D. in Environmental Sciences from UCR will produce a dissertation that contributes to fundamental knowledge in their chosen discipline. The learning outcomes from experience should include (1) an ability to critically read and evaluate scholarly literature; (2) integrate and synthesize new ideas; (3) identify relevant research questions; and (4) develop and carry out appropriate research strategies.

3. Students with a Ph.D. in Environmental Sciences should be effective communicators.

4. Students with a Ph.D. in Environmental Sciences should be capable professionals.

5. Students with a Ph.D. in Environmental Sciences who wish to pursue an academic career should have learned the skills required for them to become effective teachers.

6. Students with a Ph.D. in Environmental Sciences should have made timely progress and be satisfied with their graduate education.

Assessment Methods

**Learning Outcome 1:** Comprehensive knowledge of factual information, theoretical principles, and methodological approaches in the core areas of their chosen academic track.

A. Performance (grades) in coursework for individual tracks (listed below). Mastery of knowledge is assessed by evaluation of performance on written/oral assignments and examinations.

   a) *Environmental Chemistry and Ecotoxicology*

   All students must complete one core course: ENSC 200/ENTX 200/CHEM 246.

   Students focusing on **Environmental Chemistry** must complete 4 electives from the following list, of which at least 2 must be at the graduate level: ENSC 104, ENSC 127, ENSC 133/MCBL 133, ENSC 135/ENTX 135/CHEM 135, ENSC 136/ CHEM 136, ENSC 214, ENSC 217, ENSC 224, ENSC 225, ENSC 232, ENTX 200L, ENTX 244/ CHEM 244, ENTX 245/CHEM 245.
Students focusing on **Ecotoxicology** must complete: ENTX 201 and ENTX 208 and take at least two electives from the following list, one of which must be at the graduate level: ENSC 214, ENSC 217, ENSC 224, ENSC 225, ENSC 232, ENTX 200L, ENTX 244/CHEM 244, ENTX 245/CHEM 245, ENTX 154, ENTX 205.

b) **Environmental Microbiology**
Students must complete the following core courses: MCBL 221, MCBL 211, and at least 4 elective courses (or 12 credit hours) approved by their advisor, three of which must be at the graduate level.

c) **Soil and Water Sciences**
Students must complete one course in each of the following core course groups.
- **Chemistry**: ENSC 104, CHEM 136/ENSC 136
- **Physics**: ENSC 107, ENSC 163
- **Biology**: ENSC 133/MCBL 133, BPSC 134/ENSC 134, ENSC 141/MCBL 141
- **Natural Structure and Diversity**: ENSC 138/GEO 138, ENSC 140

Students may have completed these prior to admission or they may take them early in their graduate program. Students must present a departmental seminar summarizing results of their thesis or dissertation or internship during the final quarter of matriculation.

**B.** Performance on the written and oral qualifying exams for advancement to candidacy for the Ph.D. that covers the core areas in their chosen track of specialization.

**Learning Outcome 2:** An ability to critically read and evaluate scholarly literature; integrate and synthesize new ideas; identify relevant research questions; and develop and carry out appropriate research strategies.

A. Students are examined on their knowledge of fundamental theory and methodological approaches in the written and oral qualifying exams.

B. Formal assessment by the Major Professor is provided to their students during the annual evaluation process, with written comments on the annual evaluation form indicating areas of success and where the student still needs further scholarship.

C. Students are evaluated on their annual graduate student symposium presentations by their Major Professor and are given feedback on areas where they need improvement.

**Learning Outcome 3:** Students with a Ph.D. in Environmental Sciences should be effective communicators.

A. Student teaching evaluations.

B. Evaluation of presentations at annual graduate student symposium by the Major Professor and Graduate Advisor.
Learning Outcome 4: Students with a Ph.D. in Environmental Sciences should be capable professionals.

A. Student success in grant and fellowship applications.
B. Presentations at department seminars, regional meetings, and national conferences.
C. Publication of research results.
D. Job placement in a position commensurate with their Ph.D. degree.

Learning Outcome 5: Students with a Ph.D. in Environmental Sciences who wish to pursue an academic career should have learned the skills required for them to become effective teachers.

A. Teaching evaluations for classes in which they have served as a teaching assistant.
B. Evaluation of class lecture presentations by faculty instructors in courses for which they serve as a teaching assistant.

Learning Outcome 6: Students with a Ph.D. in Environmental Sciences should have made timely progress and be satisfied with their graduate education.

A. Completion of degree within one year of normative five-year program.
B. Exit interview with student by Graduate Advisor.
Assessment Plan for the MS Program

Program Learning Outcomes
1. Students who graduate with an M.S. in Environmental Sciences will master key concepts of the track area in which they specialize (tracks are the same as for the PhD).
2. Students who graduate with an M.S. in Environmental Sciences have experience in original research.
3. Students who graduate with an M.S. in Environmental Sciences develop skills that foster professionalism in their chosen fields.

Methods of Assessment

Learning Outcome 1: Master key concepts of the track area in which they specialize.
   A. Performance (grades) in coursework for their MS degree.
   B. Comprehensive exam that covers the fundamental concepts and knowledge of their track area.

Learning Outcome 2: Experience in original research.
   A. Successful completion of thesis project for students pursuing the Plan I (Thesis) option.

Learning Outcome 3: Professional competence.
   A. Quality of oral presentations and exit seminar.
   B. Performance on M.S. defense.
   C. Participation and research presentations at professional conferences or other professional venues.
   D. Teaching evaluations in courses where student serves as a teaching assistant.
   E. Job performance of students who participate in internships or who obtain work experience at federal or state agencies, private companies, and/or in laboratory research during their M.S. training.
   F. Job placement.