

ECOLOGY

Dual-Titles

Dual-Title Ph.D. in Ecology and Biogeochemistry

Requirements listed here are in addition to requirements listed in GCAC-208 Dual-Title Graduate Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-208-dual-titles/>).

Graduate students with research and educational interests in biogeochemistry may apply to the Biogeochemistry dual-title degree program. Students must apply and be admitted to the graduate program in Ecology and The Graduate School before they can apply for admission to the dual-title degree program. After admission to the Ecology program, students must apply for admission to and meet the admissions requirements of the Biogeochemistry dual-title program. Refer to the Admission Requirements section of the Biogeochemistry Bulletin page (<http://bulletins.psu.edu/graduate/programs/majors/biogeochemistry/>). Once a student has been admitted to the dual-title degree in Biogeochemistry, they must pass a qualifying examination that incorporates knowledge of the discipline of biogeochemistry.

It is preferred that students take a joint Ecology / Biogeochemistry qualifying examination incorporating knowledge of both the ecology and biogeochemistry disciplines. When a joint qualifying examination is administered, the qualifying examination committee will be composed of Graduate Faculty from Ecology and must include at least one Graduate Faculty member from the Biogeochemistry program.

Ecology graduate students who have already passed their qualifying examination will take a second qualifying examination focused solely on the discipline of biogeochemistry. When the Biogeochemistry qualifying examination is administered separately, faculty members who hold appointments in the Biogeochemistry Graduate Faculty may serve in administering the Biogeochemistry qualifying exam.

In either case, all qualifying examinations must be complete no later than the end of the fourth semester (not counting summer semesters) of entry into the Ecology program.

To qualify for the Biogeochemistry dual-title degree, students must satisfy the degree requirements for the Ph.D. in Ecology, listed in the Degree Requirements section. In addition, students must complete the degree requirements for the dual-title in Biogeochemistry, listed on the Biogeochemistry Bulletin page (<http://bulletins.psu.edu/graduate/programs/majors/biogeochemistry/>). Some courses may satisfy both the Ecology program requirements and those of the Biogeochemistry dual-title program.

In addition to the general Graduate Council requirements for Ph.D. committees (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-602-phd-committee-formation/>), the Ph.D. committee of an Ecology and Biogeochemistry dual-title Ph.D. student must include at least one member of the Biogeochemistry Graduate Faculty. Faculty members who hold appointments in both programs' Graduate Faculty may serve in a combined role. If the chair of the Ph.D. committee is not also a member of the Graduate Faculty in Biogeochemistry, the member of the committee representing Biogeochemistry must be appointed as co-chair. The Biogeochemistry representative on the student's Ph.D. committee will develop questions for and participate in the evaluation of the comprehensive examination.

Students in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their Ph.D. committee and reflects their original research and education in Ecology and Biogeochemistry. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the Ph.D. committee, the head of the graduate program, and the Graduate School.

Dual-Title M.S. and Ph.D. in Ecology and International Agriculture and Development

Requirements listed here are in addition to requirements listed in GCAC-208 Dual-Title Graduate Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-208-dual-titles/>).

Graduate students with research and educational interests in international agriculture and development may apply to the International Agriculture and Development (INTAD) dual-title degree program. Students must apply and be admitted to the graduate program in Ecology and The Graduate School before they can apply for admission to the INTAD dual-title degree program. After admission to their primary program, students must apply for admission to and meet the admissions requirements of INTAD dual-title program. Refer to the Admission Requirements section of the INTAD Bulletin page (<https://bulletins.psu.edu/graduate/programs/majors/international-agriculture-development/>).

Degree Requirements for Dual-Title M.S.

To qualify for the INTAD dual-title degree, students must satisfy the requirements of the Ecology M.S. program. In addition, they must satisfy the INTAD program requirements for the dual-title M.S. degree. Refer to the M.S. Degree Requirements section of the INTAD Bulletin page (<https://bulletins.psu.edu/graduate/programs/majors/international-agriculture-development/>). Some courses may satisfy both the Ecology program requirements and those of the INTAD dual-title program.

The Ecology program requires students pursuing a M.S. degree to produce a master's thesis. Dual-title students must write the thesis on a topic that reflects their education and interest in both Ecology and INTAD. At least 6 thesis research credits (ECLGY 600 or ECLGY 610) must be taken in Ecology.

All members of the student's committee for the dual-title M.S. degree will be members of the Graduate Faculty. The committee must include at least one Graduate Faculty member from INTAD. Faculty members who hold appointments in both programs' Graduate Faculty may serve in a combined role.

Degree Requirements for the Dual-Title Ph.D.

To qualify for the INTAD dual-title degree, students must satisfy the requirements of the Ecology Ph.D. program. In addition, they must satisfy the INTAD program requirements for the dual-title Ph.D. degree. Refer to the Ph.D. Degree Requirements section of the INTAD Bulletin page (<https://bulletins.psu.edu/graduate/programs/majors/international-agriculture-development/>). Some courses may satisfy both the Ecology program requirements and those of the INTAD dual-title program.

Qualifying Examination

It is preferred that students in the dual-title program take a single qualifying examination, containing elements of both Ecology and INTAD. However, in cases when students matriculate into a dual-title after they have already completed the Ecology qualifying exam, a second qualifying exam may be taken for the dual title, according to policy

GCAC-604 (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-604-qualifying-exam/>) and the guidelines of the dual-title degree program. Whether taken as a combined exam in ECLGY and INTAD or a second, separate exam for INTAD, the qualifying examination committee for the dual-title Ph.D. degree must include at least one Graduate Faculty member from the INTAD program. Faculty members who hold appointments in both programs' Graduate Faculty may serve in a combined role.

Committee Composition

In addition to the general Graduate Council requirements for Ph.D. committees (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-602-phd-committee-formation/>), the Ph.D. committee of an Ecology and INTAD dual-title Ph.D. student must include at least one member of the INTAD Graduate Faculty. Faculty members who hold appointments in both programs' Graduate Faculty may serve in a combined role. If the chair of the Ph.D. committee is not also a member of the Graduate Faculty in INTAD, the member of the committee representing INTAD must be appointed as co-chair.

Comprehensive Exam

At the end of their course work, students must pass a comprehensive examination that follows the guidelines established by the Ecology program and reflects both the Ecology program and the INTAD dual-title degree curriculum. International agriculture must be one of the key areas of the exam and the INTAD representative on the student's Ph.D. committee must have input into the development of and participate in the evaluation of the comprehensive examination.

Dissertation and Dissertation Defense

Doctoral students enrolled in the dual-title degree program are required to write and orally defend a dissertation on a topic that reflects their original research and education in both Ecology and INTAD. The dissertation should contribute to the body of knowledge in international agriculture. A public oral presentation of the dissertation is required. The dissertation must be accepted by the Ph.D. committee, the head of the graduate program, and the Graduate School, and the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree.

Dual-Title Ph.D. in Ecology and Microbiome Sciences

Requirements listed here are in addition to requirements listed in GCAC-208 Dual-Title Graduate Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-208-dual-titles/>).

Ecology Ph.D. students with research and educational interests in Microbiome Sciences may apply for admission to the Microbiome Sciences Dual-Title Degree Program. Students must first apply and be admitted to the Ecology graduate and The Graduate School before applying for admission to the dual-title program. To apply, a student should send to the MBIOM Graduate Program Advisor (microbiomesciDT@psu.edu) a written personal statement that explains their interest in Microbiome Sciences; the career goals they hope to work toward by attaining the dual-title degree; and describe actual or potential research objectives that integrate microbiome sciences. This statement should be signed by their major adviser or dissertation adviser, if assigned. Students should also send the MBIOM Graduate Program Advisor their undergraduate and graduate transcripts for review by the MBIOM Faculty-in-Charge, who will notify the Graduate School and student about the enrollment decision.

The result of the ECLGY qualifying examination serves to qualify the student's entrance to the MBIOM dual-title program. The application for

the dual-title degree program may be completed after the qualifying examination in the major program, as long as the application takes place before the end of the fourth semester.

To obtain this dual-title, students must satisfy the degree requirements for the Ph.D. in Ecology, listed in the ECLGY Degree Requirements section. In addition, students must complete the degree requirements for the MBIOM dual-title, listed on the Microbiome Sciences Bulletin page (<http://bulletins.psu.edu/graduate/programs/majors/biogeochemistry/>). Students must complete a total of 15 credits including 2 credits of ECLGY 550 (<https://bulletins.psu.edu/search/?P=ECLGY%20550>) and at least 13 credits chosen in consultation with the adviser from an approved list of courses, with at least 3 credits in each of the following areas: Microbial Sciences, Ecology and Evolution, and Bioinformatics and Research Tools.. Eight of the 15 total credits must be taken at the 500-level. No more than six of the 15 total credits can be offered by the ECLGY program.

In addition to the general Graduate Council requirements for Ph.D. committees (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-602-phd-committee-formation/>), the Ph.D. committee of an Ecology and Microbiome Sciences dual-title Ph.D. student must include at least one member of the Microbiome Sciences Graduate Faculty. Faculty members who hold appointments in both programs' Graduate Faculty may serve in a combined role. If the chair of the Ph.D. committee is not also a member of the Graduate Faculty in Microbiome Sciences the member of the committee representing Microbiome Sciences must be appointed as co-chair. The Microbiome Sciences representative on the student's Ph.D. committee will develop questions for and participate in the evaluation of the comprehensive examination.

Students in the dual-title program are required to write and orally defend a dissertation on a topic that is approved in advance by their Ph.D. committee and reflects their original research and education in Ecology and Microbiome Sciences. Upon completion of the doctoral dissertation, the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree. The dissertation must be accepted by the Ph.D. committee, the head of the graduate program, and the Graduate School.

Dual-Title M.S. and Ph.D. in Ecology and Transdisciplinary Research on Environment and Society

Requirements listed here are in addition to requirements listed in GCAC-208 Dual-Title Graduate Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-208-dual-titles/>).

Graduate students with research and educational interests in transdisciplinary research on the environment and society may apply to the Transdisciplinary Research on Environment and Society (TREES) dual-title degree program. Students must apply and be admitted to the graduate program in Ecology and The Graduate School before they can apply for admission to the TREES dual-title degree program. After admission to their primary program, students must apply for admission to and meet the admissions requirements of TREES dual-title program. Refer to the Admission Requirements section of the TREES Bulletin page (<https://bulletins.psu.edu/graduate/programs/majors/transdisciplinary-research-environment-society/>).

Degree Requirements for Dual-Title M.S.

To qualify for the TREES dual-title degree, students must satisfy the requirements of the Ecology M.S. program. In addition, they must satisfy

the TREES program requirements for the dual-title M.S. degree. Refer to the M.S. Degree Requirements section of the TREES Bulletin page (<https://bulletins.psu.edu/graduate/programs/majors/transdisciplinary-research-environment-society/>). Some courses may satisfy both the Ecology program requirements and those of the TREES dual-title program.

The Ecology program requires students pursuing a M.S. degree to produce a master's thesis. Dual-title students must write the thesis on a topic that reflects their education and interest in both Ecology and TREES. At least 6 thesis research credits (ECLGY 600 or ECLGY 610) must be taken in Ecology.

All members of the student's committee for the dual-title M.S. degree will be members of the Graduate Faculty. The committee must include at least one Graduate Faculty member from TREES. Faculty members who hold appointments in both programs' Graduate Faculty may serve in a combined role.

Degree Requirements for the Dual-Title Ph.D.

To qualify for the TREES dual-title degree, students must satisfy the requirements of the Ecology Ph.D. program. In addition, they must satisfy the TREES program requirements for the dual-title Ph.D. degree. Refer to the Ph.D. Degree Requirements section of the TREES Bulletin page (<https://bulletins.psu.edu/graduate/programs/majors/transdisciplinary-research-environment-society/>). Some courses may satisfy both the Ecology program requirements and those of the TREES dual-title program.

Qualifying Examination

The qualifying examination for Ecology will satisfy the qualifying exam requirement for the dual-title degree program in TREES. Dual-title graduate degree students may require an additional semester to fulfill requirements for both areas of study and, therefore, the qualifying examination may be delayed one semester beyond the normal period allowable.

Committee Composition

In addition to the general Graduate Council requirements for Ph.D. committees (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-602-phd-committee-formation/>), the Ph.D. committee of an Ecology and TREES dual-title Ph.D. student must include at least one member of the TREES Graduate Faculty. Faculty members who hold appointments in both programs' Graduate Faculty may serve in a combined role. If the chair of the Ph.D. committee is not also a member of the Graduate Faculty in TREES, the member of the committee representing TREES must be appointed as co-chair.

Comprehensive Exam

At the end of their course work, students must pass a comprehensive examination that follows the guidelines established by the Ecology program and reflects both the Ecology program and the TREES dual-title degree curriculum. Transdisciplinary research must be one of the key areas of the exam and the TREES representative on the student's Ph.D. committee must have input into the development of and participate in the evaluation of the comprehensive examination.

Dissertation and Dissertation Defense

Doctoral students enrolled in the dual-title degree program are required to write and orally defend a dissertation on a topic that reflects their original research and education in both Ecology and TREES. The dissertation should contribute to the body of knowledge in transdisciplinary research. A public oral presentation of the dissertation is required. The dissertation must be accepted by the Ph.D. committee, the head of the graduate

program, and the Graduate School, and the candidate must pass a final oral examination (the dissertation defense) to earn the Ph.D. degree.