

BIOMEDICAL SCIENCES

Dual-Titles

Dual-Title Ph.D. in Biomedical Sciences and Clinical and Translational 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/>).

Admission Requirements

Potential dual-title students can express an interest in the dual-title program as early as during the recruitment process for the BMS Graduate Program. Students must apply and be admitted to the graduate program in BMS and the Fox Graduate School before they can apply for admission to the dual-title Ph.D. in Clinical and Translational Sciences (CTS). Refer to the Admission Requirements section of the Clinical and Translational Sciences Bulletin page (<http://bulletins.psu.edu/graduate/programs/majors/clinical-translational-sciences/>). Students must apply and be admitted to the dual-title program in CTS prior to taking the qualifying exam.

Degree Requirements

To qualify for the dual-title degree in Biomedical Sciences and Clinical and Translational Sciences, students must satisfy the BMS Ph.D. degree requirements listed on the Degree Requirements tab. In addition, students pursuing the dual-title Ph.D. in BMS and CTS must complete the degree requirements for the dual-title CTS Ph.D., listed on the CTS Bulletin page (<http://bulletins.psu.edu/graduate/programs/majors/clinical-translational-sciences/>). Up to 5 credits for the Ph.D. degree in BMS that overlap with the CTS elective requirements can be counted toward the CTS dual-title.

The choice of CTS electives is subject to approval by the student's academic adviser(s) from the BMS and CTS programs. The electives should complement the student's work in BMS. A list of approved electives is maintained by the CTS program office.

The qualifying examination contains elements of both BMS and CTS. In accordance with Graduate Council policy, the qualifying examination committee must include at least one member of the CTS Graduate Faculty. Faculty with graduate appointments in both programs may serve in a combined role. 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.

In addition to the general Graduate Council requirements for Ph.D. committees (<http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/phd-dissertation-committee-formation/>), the Ph.D. committee must include at least one member of the CTS Graduate Faculty. Faculty members who hold appointments in the Graduate Faculty of both programs may serve in a combined role. If the chair of the Ph.D. committee is not a member of the Graduate Faculty in CTS, the member of the committee representing CTS must be appointed as co-chair. The fields of BMS and CTS will be integrated in the student's comprehensive exam, and the Ph.D. committee member representing CTS is responsible for insuring coverage of information relevant to the CTS field of study.

The candidate must complete a dissertation on a topic that reflects their original research and education in both BMS and CTS. To earn the dual-title Ph.D. degree, the dissertation must be accepted by the Ph.D. committee, the chair of the graduate program, and the Fox Graduate School, and the student must pass a final oral examination (the dissertation defense).

DUAL-TITLE PH.D. IN Biomedical Sciences 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/>).

Doctoral students with research and educational experiences in BMS may apply to the BMS-Microbiome Sciences Dual-Title Doctoral Degree Program. The goal of the dual-title Ph.D. degree in BMS and Microbiome Sciences is to enable BMS graduate students to acquire the knowledge and skills of their major area of specialization in BMS, while at the same time gaining expertise and skills in Microbiome Sciences. Graduate study in this program seeks to provide students with the intellectual foundation for integrated and mechanistic understanding of interactions between hosts, microbes, and their environment. Interdisciplinary training that includes Microbiome Sciences will prepare students for positions in academia, government, non-profit organizations, and the private sector.

Admission Requirements

For admission to the dual-title doctoral degree in Microbiome Sciences, a student must first apply and be admitted to the BMS PhD graduate program and The Fox Graduate School, preferably but not necessarily discussing the dual-title interest beforehand with a major adviser who has been appointed to the Microbiome Sciences program. After admission to their primary program, students must apply for admission to and meet the admissions requirements of the Microbiome Sciences dual-title program. Refer to the Admission Requirements section of the Microbiome Sciences Bulletin page (<https://bulletins.psu.edu/graduate/programs/majors/microbiome-sciences/>). Doctoral students should enroll in a dual-title graduate degree program early in their training, and no later than the end of the fourth semester (not counting summer semesters) of entry into the graduate major program.

Degree Requirements

To qualify for the dual-title degree, students must satisfy the BMS Ph.D. degree requirements. In addition, students pursuing the dual-title Ph.D. in BMS and Microbiome Sciences must complete the degree requirements for the dual-title Microbiome Sciences Ph.D., listed on the Microbiome Sciences Bulletin page (<https://bulletins.psu.edu/graduate/programs/majors/microbiome-sciences/>). To fulfill the course requirements for the dual-title in Microbiome Sciences, students must complete a total of 15 credits including 2 credits of MBIOM 550 (<https://bulletins.psu.edu/search/?P=MBIOM%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. Students are required to have two advisers from separate disciplines: one individual serving as a primary adviser in their major degree program and a secondary adviser in an area within a field covered by the dual-title program who is a member of the Microbiome Sciences Graduate Faculty. The major program adviser will normally also be a member of the Microbiome Sciences Graduate Faculty. The two faculty advisers can represent different academic programs, but

this is not required, as faculty from a scientifically diverse department could represent very different areas of expertise.

The qualifying examination for BMS will satisfy the qualifying examination requirement for the dual-title degree program in Microbiome Sciences.

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 a BMS and Microbiome Sciences dual-title doctoral degree 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 enrolled in the dual-title program are required to write and orally defend a dissertation on a topic that reflect their original research and education in BMS 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 Fox Graduate School.