

Biology – Industrial Biosciences PSM, MS

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College of Science and Technology

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The primary objective of the Professional Science Master's concentration in Industrial Biosciences is to provide students with advanced technical skills, industry-guided knowledge, and business training to prepare them for work in the commercial sector. To support this objective, this program will develop in all participants, through training experiences and other enrichment activities, scientific understanding, understanding of the commercialization process, critical judgment, and personal integrity. Specifically, this program is designed to enhance the student's ability to manage scientific projects, to understand regulatory, ethical and legal dimensions of science-based work, to become competent using state-of-the-art research equipment, and to improve the student's proficiency in oral and written communication. Students will have opportunities to pursue training in specific project areas, including genetics, microbiology, biotechnology, bioinformatics, physiology, evolution, toxicology, and health disparities research.

Additional Admission Requirements

- A Bachelor's Degree in Biology or a related discipline from an accredited institution.
- Chemistry through Organic II
- One year of Calculus
- One year of Physics
- One year of Cellular and Molecular Biology

Program Outcomes:

- **Communication skills:** Students completing the MS degree program in Biology will exhibit effective communication skills (written, oral, graphic and interpersonal) appropriate for professionals in this field of study at the master's or doctoral level.
- **Critical Thinking skills:** Students completing the MS degree program in Biology will effectively use quantitative and/or qualitative analytical problem-solving skills appropriate for professionals in this field of study at the master's or doctoral level.
- **Disciplinary Expertise:** Students completing the MS degree program in Biology will demonstrate a level of discipline-specific expertise (knowledge, skills, and professionalism) appropriate for professionals in this field of study at the master's or doctoral level.
- **Research/Creative Engagement:** Students completing the MS degree program in Biology will demonstrate ability to engage productively in the review and conduct of disciplinary research and creative professional activity appropriate for professionals in this field of study at the master's or doctoral level.

Degree Requirements (Total credit hours: 30)

- **Core courses (9 credits):** BIOL 749, 761; CHEM 651
- **Disciplinary Electives:** Select 6 credit hours from BIOL with approval of PSM coordinator
- **Business/Management Electives:** Select 6 credit hours from graduate courses in business and economics with approval of advisor
- **Ethics Electives:** Select 3 credit hours from: MKTG 636; WMI 617, or other course with approval of advisor
- **Experiential component:** Project (BIOL 796: 6 credit hours)

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Example Sequence of Courses

Year 1, Fall (total 9 credit hours)

BIOL 749, Recent Advances in Cell Biology (Core course), 3 credit hours

BIOL 703, Experimental Biology (Disciplinary Elective*), 3 credit hours

BIOL 785, Writing in the Sciences (Core course), 3 credit hours

Year 1, Spring (total 9 credit hours)

CHEM 651, General Biochemistry (Core course), 3 credit hours

MGMT 605, Methods in Business Analysis (Business/Management Elective*), 3 credit hours

BIOL 640, Intro Bioinformat & Genomi Rsc (Disciplinary Elective*), 3 credit hours

Year 2, Fall (6 credit hours)**

Experiential component: Project (BIOL 796), 6 credit hours

Year 2, Spring (6 credit hours)**

LEST 810, Ethics & Social Responsibility (Ethics Elective*), 3 credit hours

MGMT 612, Foundations of Enterprise Management (Business/Management Elective*), 3 credit hours

* All electives need to be approved by the advisor.

** Students may need to take additional courses in order to have 9 credit hours and be at full-time status.