

McCormick

Northwestern Engineering

Master of Biotechnology Program

Preparing engineers, chemists, and biologists for careers in the biotechnology and pharmaceutical industries



MBP class of 2006-2007

Program Highlights

- Focused and integrated training for engineers, chemists, and biologists.
- 15 months (five quarters) of study.
- Four quarters of research guided by a Northwestern faculty mentor.
- Core education in bioprocess engineering theory and laboratory practice.
- Seminars on the legal, regulatory, business, and ethical aspects of biotechnology — many presented by industry professionals and members of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University.
- Instruction in oral, written and interpersonal communication.
- Placement assistance provided by a full-time industrial liaison.

Admission Requirements

The MBP admission requirements emphasize strong quantitative skills and knowledge of molecular sciences and include at least one year of calculus, one year of organic chemistry, one year of physical chemistry (or at least general chemistry), a sophomore-level cell/molecular biology course, and research experience in either an academic or industrial setting. When making admission decisions, the program takes a holistic approach, considering many factors including GRE scores, a GPA of at least 3.1 on a 4.0 scale, letters of support and performance during the interview (in person or by phone).



Master of Biotechnology Program

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Program Overview

The Master of Biotechnology Program (MBP) was established in 2003; it is administered by the Department of Chemical and Biological Engineering. The MBP is distinguished from other Masters of Biotechnology programs by the integration of biology and engineering, combined with extensive hands-on research in Northwestern University faculty laboratories.

Degree

Master of Science in Biotechnology conferred by Northwestern University's Robert R. McCormick School of Engineering and Applied Science. The degree requirements include a total of 20 units — 12 units of coursework and 8 units of research, overall GPA of 3.0 or better on a 4.0 scale, and written and oral research reports in lieu of a thesis.

Format and Tuition

The MBP is a 15 month (five-quarter) full-time program; a part-time option is available on a case-by-case basis. The projected tuition for '09-'10 is \$12,360 per quarter.

Curriculum

RESEARCH: 3 quarters at 20 hr/week, plus summer quarter at 40 hr/week directed by Northwestern faculty in the departments of Biomedical Engineering; Chemical and Biological Engineering; Neurobiology and Physiology; Biochemistry, Molecular and Cell Biology; the Lurie Cancer Center, and the Feinburg School of Medicine. The pool of research preceptors currently includes 17 faculty and is growing.



CORE COURSES: Bioprocess Engineering I (upstream processing), Bioprocess Engineering 2 (downstream processing), Biotechnology Laboratory, Bioprocess Engineering Laboratory, Microbial Biotechnology, Biotechnology Applications of Immunology, and Seminars.

REQUIRED COURSES: Mass Balances and Kinetics for Bioprocessing, Fluids and Mass Transfer for Bioprocessing, Biochemistry, Cell Biology, and Molecular Biology; electives

may be substituted for these required courses if these or equivalent courses have been completed during previous studies.

ELECTIVES: Popular electives include Statistics, Cell Materials Interactions, Functional Genomics, and Physical Biochemistry. Students may also enroll in up to two Kellogg School of Management electives, such as Managerial Leadership.

Students

The majority of MBP students are recent graduates; students' majors include biology, biochemistry and various engineering disciplines.

Student Placement

MBP graduates have obtained positions with large and small companies in the pharmaceutical, biotechnology, consulting and high tech industries. Representative examples of the companies and positions include Abbott (cell/molecular biologist), Amgen (senior associate, process development), Baxter (engineer), Bristol-Myers-Squibb (associate engineer), Coskata Energy (scientist), Genentech (operations/

rotational development analyst), PDL Biopharma (development scientist), Accenture (consulting analyst), and Sg2 (senior analyst).

Governance

MBP staff includes the program director W.M. Miller, associate director I. Kourkine, lecturer A. Felse, industrial liaison B. Lane, and program coordinator J. Lobb. Advice on academic and professional components of the program is provided by an Advisory Board composed of biotechnology industry professionals.



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