



**Katz**  
Katz School  
of Science and Health

# MS in Biotechnology Management and Entrepreneurship

## Course Descriptions

### BTM 1500 Foundations of Biotechnology

Get a top-level understanding of the interdisciplinary scientific foundations of biotechnology. Topics include the molecular foundations of biotechnology; molecular microbiology; receptor pharmacology; drug development processes; biotech process development and scale-up; drug approval and regulatory affairs; genomics; microarray analysis; proteomics; computational biology; molecular modeling; analytical biotechnology; bioterrorism; and biotechnology.

### BTM 5200 Biotechnology Management

Get an overview of the activities and knowledge required to lead and administer biotechnology and pharmaceutical companies. Topics include health technology assessment and cost-effectiveness analysis; personalized medicine, pharmacogenomics, and companion diagnostics; drug pricing and reimbursement; governmental payers; patents and intellectual property; and information in health care.

### BTM 5300 Pharmacology Product Development and Commercialization

Obtain a working knowledge of the policies, processes, and procedures for drug-discovery, development, and commercialization. Topics cover drug development from bench to bedside, including portfolio and pipeline management; and health economics research.

### BTM 5400 Applications of Biotechnology

Get an overview of the many different applications of biotechnology in medicine and the fundamental science underlying these products and techniques. Topics include DNA sequencing; immunology; microscopy; culture and differential staining; and pharmacogenomics, among others.

### BTM 6500 Capstone in Biotechnology Management and Entrepreneurship

Integrate the skills developed in previous classes into a comprehensive body of knowledge and will provide tangible evidence of competencies in Biotechnology Management and Entrepreneurship. The capstone will include four components: 1) a brief proposal and project schedule; 2) the main project deliverable; 3) a final presentation; and 4) a reflection of your knowledge of biotechnology operations, commercialization and product development.

### BTM 5000 Survey of Life Sciences

Explore a survey of biochemistry, cellular and molecular biology. Topics include the structure of cells; proteins, carbohydrates, lipids, and nucleic acids; DNA, genetics and gene expression; cell growth and cancer; and metabolism-energy generation and their implications for disease and drugs.

### BTM 5600 Applied Biologics

This course is composed of multiple modules, each focused on a particular technology such as DNA sequencing, proteomics, metabolomics, imaging, synthetic biology, immunology, gene editing etc.).

### BTM 6000 Biostatistics and Informatics

Get the fundamental principles of experimental design, statistical and exploratory data analysis and visualization, emphasizing research related to human health and clinical settings. Statistical topics include descriptive statistics; hypothesis testing; analysis to variance; correlation; regression; chi-square test; and nonparametric methods. Study design topics include population selection; inclusion/exclusion criteria; strengths and limitations of respective study designs; and interpretation of study results.

### BTM 6100 Clinical Trials and Research Management

Get an interdisciplinary, state-of-the-art scientific introduction of clinical trials and research management to biotechnology to students. Topics include designing and managing clinical trials; trials documentation; pediatric trials; risk management; IRB and FDA guidelines for clinical trials; NIH and NSF grants management; and clinical trials data management and protocols.

### BTM 5700 Finance for Startups and Entrepreneurial Ventures

Create a foundation for making financial decisions in startups and entrepreneurial ventures. Topics include basic accounting principles; financial statement analysis (income statements, balance sheets, and statement of cash flows); strategic planning; capital budgeting and forecasting; expectations of investors; methods of valuation; dilutive and non-dilutive sources of funding; developing investor pitches; negotiating term sheets; and evaluating exit strategies.

### MAN 5580 Project Management

Most data analysis and visualization work is project-based, and successful data analysts are effective at managing projects and collaborating as members of project teams. This course teaches project management using several tools from the leading methodologies for managing software projects. The most effective project managers will combine methods to create a "right-sized" methodology appropriate to the organizational culture and project team members' background and experience.

### MAR 5815 Marketing Management

The purpose of this course is to provide Marketing students with a solid foundation in modern marketing from a strategic, general management perspective. The concepts and techniques presented in the class address issues such as customer insights, competitive analysis, market segmentation, positioning strategy, and marketing decisions that managers make to support an effective marketing strategy. To reflect the scope of today's business world, the course will approach marketing across a variety of contexts, incorporating diverse perspectives such as: domestic and international, products and services, and conventional and unconventional communications methods. Through class projects, hands-on group exercises, case studies, and class discussions, we will explore marketing strategy and its implementation through what is traditionally called the "marketing mix." As we progress, it will become apparent that each of these decisions affects the others and that they must all be framed as part of an integrated marketing strategy.

### BME XXXX Intellectual Property, Regulation, and Compliance for Biotechnology

This is an introduction to the legal system, including contract and intellectual property law; an understanding of the key regulatory agencies and areas of compliance impacting biotechnology activities; and a strong foundation in the ethical issues concerning the development and commercialization of biotechnology products. Topics include criminal and civil liability; laws that govern the use, testing, development and licensing of biotechnology; regulatory agencies; quality assurance; and ethics of research, among others.

### BME XXXX Technology Entrepreneurship

Get an introduction to the critical factors of success for entrepreneurial ventures and examine intrapreneurship within existing companies. Topics include innovation models; diffusion of innovations; growth-share matrix; identifying high value opportunities; developing a business plan; determining pricing and implementing an integrated marketing strategy; entrepreneurial leadership; innovation ecosystems and networks of innovation; hiring talent and managing incentives; financial management; and acquisition of capital.

### BTM 6450 Internship in Biotechnology Management and Entrepreneurship

This course consists of an off-campus internship supervised by a staff person at the internship site and overseen by a faculty advisor. The internship site must be approved by the program director, and the overall duration of student work must be no less than 150 hours (based on a 3-credit course). At the start of the internship, you and the faculty advisor will jointly develop specific learning objectives tailored to the nature of the internship. Over the course of the internship, you will be required to submit weekly reflections, and at the end of the internship, write a final paper that represents the culmination of the work performed.

### BTM 6900 Special Topics in Biotechnology Management and Entrepreneurship

This course provides the opportunity to offer boutique short-term courses on emerging phenomena, policies, processes, technologies, and techniques in data analysis and visualization. The expectation is that this will be an advanced class requiring an appropriate student project and deliverable in line with the number of credits awarded for the course.

### BTM 6999 Independent Study in Biotechnology Management and Entrepreneurship

This independent study course provides you with the flexibility to learn more about a topic of interest outside of the formal course setting. The subject should be chosen in consultation with a faculty advisor who acts as your supervisor, and with the permission of the program director. You will be required to submit a course contract describing the course of study and its specific learning objectives. Course credit is determined in advance of the course, by the instructor with the approval of the program director.

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