Master of Science in Biotechnology

A world-class curriculum fusing science, business and law

Transform your career in the field that’s transforming our world.

www.ms-biotech.wisc.edu
The Master of Science in Biotechnology continues to spur breathtaking discoveries and life-saving innovations. But to realize its full potential, the industry needs equally innovative leaders—professionals who combine the skills of scientist, business strategist and public policy advocate. Success in biotechnology demands cross-functional expertise and global vision—strengths the Master of Science in Biotechnology program at the University of Wisconsin-Madison forges in its students.

Designed for You
Drawing on the resources of a global leader in biotechnology and translational research, we’ve designed the M.S. in Biotechnology for biotech professionals who are ready to broaden their understanding and skills—and advance in their careers. If you’re a practicing scientist, technical professional, attorney or business/operations strategist who’s poised to move into a position of greater responsibility, we’ve built the program with you in mind.

You’ll participate in convenient evening and weekend courses scheduled to accommodate challenging careers and family lives. You’ll benefit from expert instruction, personalized career resources and technical support focused on one goal—helping you achieve the maximum return on your investment.

The Master of Science in Biotechnology
Biotechnology continues to spur breathtaking discoveries and life-saving innovations. But to realize its full potential, the industry needs equally innovative leaders—professionals who combine the skills of scientist, business strategist and public policy advocate. Success in biotechnology demands cross-functional expertise and global vision—strengths the Master of Science in Biotechnology program at the University of Wisconsin-Madison forges in its students.

Designed for You
Drawing on the resources of a global leader in biotechnology and translational research, we’ve designed the M.S. in Biotechnology for biotech professionals who are ready to broaden their understanding and skills—and advance in their careers. If you’re a practicing scientist, technical professional, attorney or business/operations strategist who’s poised to move into a position of greater responsibility, we’ve built the program with you in mind.

You’ll participate in convenient evening and weekend courses scheduled to accommodate challenging careers and family lives. You’ll benefit from expert instruction, personalized career resources and technical support focused on one goal—helping you achieve the maximum return on your investment.

RELEVANT, REAL, REWARDING
The M.S. in Biotechnology begins each fall with a class of up to 30 students. This group works together closely over the next two years, sharing experiences and forging lasting bonds. To ensure enriching and varied perspectives, we select students from a broad range of professional backgrounds.

The learning environment benefits from a unique level of academic and industrial collaboration. We draw leading-edge content from the UW’s highly ranked schools of law, medicine, business, pharmacy, engineering, and agricultural and life sciences. And through our affiliations with University Research Park, the Wisconsin Alumni Research Foundation—the University’s patenting and licensing agency—and the Biopharmaceutical Technology Center Institute, we give students an insider’s look at emerging technologies and start-up companies.

All courses are team-taught by world-class UW faculty and instructors from Wisconsin’s biotechnology corridor—one of the nation’s most dynamic. As a student, you receive an unmatched foundation in academic and industrial collaboration. We draw leading-edge content from the UW’s highly ranked schools of law, medicine, business, pharmacy, engineering, and agricultural and life sciences. And through our affiliations with University Research Park, the Wisconsin Alumni Research Foundation—the University’s patenting and licensing agency—and the Biopharmaceutical Technology Center Institute, we give students an insider’s look at emerging technologies and start-up companies.

Coursework creates rich opportunities to test and strengthen skills in teamwork, communication and problem solving. As you learn about the challenges faced by today’s biotechnology industry, you gain skills and knowledge that enhance your on-the-job performance and lay the groundwork for advancement.
Program begins with an emphasis on technology assessment. In addition to these courses, you will work as part of a team on a semester-long technology assessment project that puts everything you've learned into practice. Intellectual Property, Patents, and Licensing. Intellectual property and patent law have influenced—and been influenced by—the development and commercialization of advances in biotechnology. This course presents important core concepts, including intellectual property, patent law, trademarks, copyrights, trade secrets, licensing, and patent litigation. You'll learn about the types of intellectual property and how they fit together to protect a product or service. You'll understand the fundamentals of licensing and transfer and the important role of patent examiners. You'll also explore the recent aspects of early-stage intellectual property and its applications.

Business of Biotechnology: Fundamentals. There are major challenges inherent in translating scientific discoveries into business success. This course examines how core business principles apply to the operation of biotechnology companies. You'll learn the difference between scientific and commercial opportunities and gain insights into the challenge of balancing product usefulness with positive return on investment. You'll learn how to assess a technology in terms of market and feasibility and use appropriate financial tools to evaluate investments and measure overall progress. You'll integrate what you've learned by conducting an opportunity assessment for a candidate technology.

Molecular Technologies I. Here students play the role of staff scientists evaluating the technical merits and feasibility of competing molecular technologies. The innovative curriculum focuses on biotechnology methods and practice, effective written and oral scientific communication, genetic mutation detection and the role of automation in biotechnology. In hands-on laboratory sessions, you'll perform nuclear acid purification, quantitation and analysis and PCR and RT-PCR-based analysis. You'll enhance your working understanding of molecular biology and biotechnology with training in scientific communication. You'll learn how to maintain a laboratory notebook, write strong essays and papers, give effective presentations, write technical protocols, and plan and prepare laboratory meetings and team presentations.

Biotchnology Regulation and Ethics. Since biotechnology emerged as an industry, political and ethical legal issues have shaped its development. This course will expose you to some of the most important areas of regulation, including FDA oversight of gene therapy and drug, device and biologics development; EPA/USDA regulation of agricultural applications of biotechnology; federal regulation of genetic testing services; and the politics and regulation of embryonic stem cell research. You'll learn how regulation is developed and how it interacts with business and finance to influence the financial health of biotechnology companies. You'll also explore the ethical issues that help shape public policies on biotechnology and its applications.

YEARS I SPRING: PRODUCT DEVELOPMENT
In the second semester, you'll build on previous coursework and gain in-depth exposure to regulatory affairs, quality assurance and biomanufacturing. Biotechnology Operations. To succeed, biotechnology companies must juggle a host of complex technological and managerial functions. This course takes a close-up look at seven interdependent functional specialties key to developing products for human health regulatory affairs, quality assurance, biomanufacturing, quality control, non-clinical development, clinical development and project management. You'll understand how companies plan, manage, coordinate and synchronize these disciplines to support a specific marketing plan—and how the underlying principals and practices are relevant to product development in other areas of biotechnology. You'll also learn how to design a development strategy, communicate objectives and lead a team through implementation.

Molecular Technologies II. This second laboratory-intensive course explores biotechnologies with research, industrial and diagnostic applications—with a special emphasis on nucleic acid and protein analysis in diverse areas of biotechnology. Classroom and lab activities include gene cloning, protein expression and purification on a manufacturing scale; the detection of genetically modified organisms and its implications for science and society; automation in biotechnology, and human genetic identity and its role in forensics. You'll also hear guest lectures on directed evolution through protein engineering and DNA, protein and cell microarrays. The biomanufacturing laboratory component highlights many of the topics covered in Biotechnology Operations.

YEARS I FALL: TECHNOLOGY ASSESSMENT
This program begins with an emphasis on technology assessment. In addition to these courses, you will work as part of a team on a semester-long technology assessment project that puts everything you’ve learned into practice. Intellectual Property, Patents, and Licensing. Intellectual property and patent law have influenced—and been influenced by—the development and commercialization of advances in biotechnology. This course presents important core concepts, including intellectual property, patent law, trademarks, copyrights, trade secrets, licensing, and patent litigation. You’ll learn about the types of intellectual property and how they fit together to protect a product or service. You’ll understand the fundamentals of licensing and transfer and the important role of patent examiners. You’ll also explore the recent aspects of early-stage intellectual property and its applications.

Business of Biotechnology: Fundamentals. There are major challenges inherent in translating scientific discoveries into business success. This course examines how core business principles apply to the operation of biotechnology companies. You’ll learn the difference between scientific and commercial opportunities and gain insights into the challenge of balancing product usefulness with positive return on investment. You’ll learn how to assess a technology in terms of market and feasibility and use appropriate financial tools to evaluate investments and measure overall progress. You’ll integrate what you’ve learned by conducting an opportunity assessment for a candidate technology.
The unlimited potential of biotechnology comes with complex scientific, business and management challenges. In this final semester, you’ll complete a fully integrated capstone project that spans all three courses. You’ll select a technology, assess its business potential and explore the management issues that define its potential as a marketable product.

Business of Biotechnology: Frontiers and Strategies. Organizations spend significant time and resources attempting to map out effective strategies to outperform competitors and achieve lasting success. How does a firm choose which technologies to develop—and which strategic partners are the best fit? This course tackles critical management issues in the industry and explores how senior leaders manage knowledge, weigh bundles of potential opportunities, make choices and deal with uncertainty. By deepening your understanding of business strategies, you’ll be prepared to understand firm-level strategic development and apply strategy principles in day-to-day operations.

Advanced Biotechnology. This course is a capstone experience that challenges students to integrate and apply everything they’ve learned in the program to this point. You’ll participate with your colleagues in classroom activities focused on important global challenges in biotechnology today. You’ll also conduct independent research on a global issue that’s potentially beneficial to your career and employer. Through this advanced course, you’ll deepen your understanding of new technologies, broaden your awareness of international ethics and regulatory issues, and discover new opportunities for collaboration and entrepreneurship.

Project Management and Leadership. Empowering people and teams to work together is fundamental to personal and business success. This course explores project management as a “socio-technical media”—covering the technical, sociological and leadership skills that are critical to effective business, research, development, legal and global community relationships. You’ll integrate information and skills from your job and previous courses to respond to sample situations faced by biotechnology project managers. You’ll know how to design, use and defend a project management plan. You’ll also develop and test the skills needed to build and lead project teams of collaborators, partners, contractors, senior management and investors—helping them solve problems, make decisions and manage risk.

“The M.S. in Biotechnology gave me the confidence and credentials to develop my dream in a new industry I’m passionate about. Every day, the topics we explored—financial, legal, and global—that we covered in the classroom come into play at my job. I work with colleagues from around the world, and have learned to understand and work with diverse cultures.”

Đeep DeWeer, Class of 2009
Senior Business Consultant
Beckman Coulter Genomics
WORLD-CLASS FACULTY

The University of Wisconsin-Madison is recognized internationally for faculty expertise and partnerships with industry. The M.S. in Biotechnology program builds on this collaborative tradition with a faculty of leading academic researchers and leaders in the biotechnology industry.

Richard L. Moss, Ph.D.
Executive Director, Master of Science in Biotechnology Program; Associate Dean for Basic Research, Biotechnology and Graduate Studies, UW-Madison School of Medicine and Public Health

Kurt J. Zimmerman, M.S.
Director, Master of Science in Biotechnology Program

Natalie Betz, Ph.D.
Faculty Associate and Assistant Director, Master of Science in Biotechnology Program

Karin Borgh, Ph.D.
Adjunct Professor; Executive Director, Biopharmaceutical Technology Center Institute

Thomas J. Burke, Ph.D.
Adjunct Professor; Director of Assembly Development, Cellular Dynamics International Corporation

Mason Carpentar, Ph.D.
Associate Professor of Strategic Management, UW-Madison School of Business

Gabriela S. Cazar, Ph.D.
Associate Professor of Animal Sciences, UW-Madison College of Agriculture and Life Sciences

R. Alta Charo, J.D.
Professor of Law and Bioethics, UW-Madison Law School and School of Medicine and Public Health

Anthony J. Clemento Jr., M.S.
Adjunct Professor, UW-Madison School of Medicine and Public Health

Hansi J. Dean, Ph.D.
Adjunct Professor, Director of New Alliances, International AIDS Vaccine Initiative

Hector F. Deluca, Ph.D.
Harry Steenbock Research Professor, UW-Madison College of Agriculture and Life Sciences

Randall P. Dunham, Ph.D.
Professor of Management and Human Resources, UW-Madison School of Business

Phillip Greenwood, M.B.A., Ph.D.
Senior Lecturer, UW-Madison School of Business

Michael Falk, J.D., M.B.A., M.S.
Adjunct Professor, Chief of Staff and Chief Legal Counsel, Wisconsin Alumni Research Foundation

Jennifer Gottwald, Ph.D.
Adjunct Professor; Licensing Manager, Wisconsin Alumni Research Foundation

Carl Gulbrandsen, Ph.D., J.D.
Adjunct Professor; Managing Director, Wisconsin Alumni Research Foundation

Eugene M. McNally, Ph.D.
Adjunct Professor; Executive Director, Product Development and Manufacturing, PPD Inc.

Anne S. Miner, M.B.A., Ph.D.
Professor of Management and Human Resources, UW-Madison School of Business

R.D. Nair, Ph.D.
Professor of Accounting and Information Systems, UW-Madison School of Business

Pilar Ossario, Ph.D.
Professor of Law, UW-Madison Law School

David R. Piper, Ph.D.
Adjunct Professor; Senior Manager, Research and Development, Life Technologies Corporation

Phillip A. Pindstab, Ph.D.
Professor of Marketing, UW-Madison School of Business

Michael Roy, Ph.D., RAC
Adjunct Professor; Senior Scientist, Science Applications International Corporation

Cheryl Scadlock, M.S.
Faculty Associate, Information Specialist, Wisconsin Alumni Research Foundation

Richard Schifreen, Ph.D.
Adjunct Professor; President and CEO, Pathea Technologies

Cheryl P. Volkrey, M.B.A.
Adjunct Professor; Principal, The Bachner-Vickroy Group

Eric B. Vincent, Ph.D.
Adjunct Professor; Product Manager, Promega Corporation

Richard L. Moss, Ph.D.
Executive Director, Master of Science in Biotechnology Program; Associate Dean for Basic Research, Biotechnology and Graduate Studies, UW-Madison School of Medicine and Public Health

Kurt J. Zimmerman, M.S.
Director, Master of Science in Biotechnology Program

Natalie Betz, Ph.D.
Faculty Associate and Assistant Director, Master of Science in Biotechnology Program

Karin Borgh, Ph.D.
Adjunct Professor; Executive Director, Biopharmaceutical Technology Center Institute

Thomas J. Burke, Ph.D.
Adjunct Professor; Director of Assembly Development, Cellular Dynamics International Corporation

Mason Carpentar, Ph.D.
Associate Professor of Strategic Management, UW-Madison School of Business

Gabriela S. Cazar, Ph.D.
Associate Professor of Animal Sciences, UW-Madison College of Agriculture and Life Sciences

R. Alta Charo, J.D.
Professor of Law and Bioethics, UW-Madison Law School and School of Medicine and Public Health

Anthony J. Clemento Jr., M.S.
Adjunct Professor, UW-Madison School of Medicine and Public Health

Hansi J. Dean, Ph.D.
Adjunct Professor, Director of New Alliances, International AIDS Vaccine Initiative

Hector F. Deluca, Ph.D.
Harry Steenbock Research Professor, UW-Madison College of Agriculture and Life Sciences

Randall P. Dunham, Ph.D.
Professor of Management and Human Resources, UW-Madison School of Business

Phillip Greenwood, M.B.A., Ph.D.
Senior Lecturer, UW-Madison School of Business

Michael Falk, J.D., M.B.A., M.S.
Adjunct Professor, Chief of Staff and Chief Legal Counsel, Wisconsin Alumni Research Foundation

Jennifer Gottwald, Ph.D.
Adjunct Professor; Licensing Manager, Wisconsin Alumni Research Foundation

Carl Gulbrandsen, Ph.D., J.D.
Adjunct Professor; Managing Director, Wisconsin Alumni Research Foundation

Eugene M. McNally, Ph.D.
Adjunct Professor; Executive Director, Product Development and Manufacturing, PPD Inc.

Anne S. Miner, M.B.A., Ph.D.
Professor of Management and Human Resources, UW-Madison School of Business

R.D. Nair, Ph.D.
Professor of Accounting and Information Systems, UW-Madison School of Business

Pilar Ossario, Ph.D.
Professor of Law, UW-Madison Law School

David R. Piper, Ph.D.
Adjunct Professor; Senior Manager, Research and Development, Life Technologies Corporation

Phillip A. Pindstab, Ph.D.
Professor of Marketing, UW-Madison School of Business

Michael Roy, Ph.D., RAC
Adjunct Professor; Senior Scientist, Science Applications International Corporation

Cheryl Scadlock, M.S.
Faculty Associate, Information Specialist, Wisconsin Alumni Research Foundation

Richard Schifreen, Ph.D.
Adjunct Professor; President and CEO, Pathea Technologies

Cheryl P. Volkrey, M.B.A.
Adjunct Professor; Principal, The Bachner-Vickroy Group

Eric B. Vincent, Ph.D.
Adjunct Professor; Product Manager, Promega Corporation

Our graduates’ understanding of business strategy, sensitivity to bioethical issues and awareness of global markets helps them accelerate the development, launch and delivery of new and groundbreaking products. They—and their companies—also reap lasting rewards from a close network of professional peers spanning multiple facets of the biotechnology industry.

L A S T I N G D I V I D E N D S F O R E M P L O Y E R S

Supporting a student in the M.S. in Biotechnology program is an investment with significant benefits. The curriculum is based on world-class faculty expertise, significant market research and frequent engagement with the biotechnology industry. Throughout the program, students gain increased confidence, heightened critical thinking abilities and refined communication skills they can put to work immediately—

not just after graduation.

C O M P A N I E S W I T H P R O G R A M P A R T I C I P A N T S

Abbott Laboratories Inc.
Agilent Technologies Inc.
American Consulting Inc.
Astellas LLC
Aurora Healthcare Inc.
Baxter Healthcare
Benchmark Coulter
Bio-Rad Laboratories
Biotechnology Center, UW-Madison
Blood Center of Southeastern Wisconsin
Cell Line Genetics
Cellular Dynamics International
CIBC World Markets
Covance Inc.
Danisco USA
Dean Healthcare
Department of Biochemistry, UW-Madison
Department of Genetics, UW-Madison
Department of Horticulture, UW-Madison
Department of Pharmacology, UW-Madison
Department of Psychiatry, UW-Madison
Dow Chemical Corporation
EarthTech
Exact Sciences
G E Healthcare
Genome Center of Wisconsin
Genome International Corporation
Gencorp Inc.
GlucoSmith/Inova Inc.
Greenbrier & Russel Hologic Inc.
Hospira Inc.
Intralogic Inc.
Laboratory for Molecular and Computational Genomics, UW-Madison
LaFollette, Godfrey & Kahn LLC
Life Technologies Corporation
Lucigen Inc.
McAndre Laboratory for Cancer Research, UW-Madison
Medical School, UW-Madison
MiniTube of America
Monsanto Corporation, Agracetus
Cancer
Monsanto Corporation, Protein Technologies
National Primate Research Center, UW-Madison
Novagen, EMD Biosciences
PPD Inc.
Pfizer Biotechnology Inc.
Platyplus Technologies Inc.
Prodesse Inc.
Promega Corporation
Roche Nimblegen
St. Mary’s Hospital
School of Pharmacy, UW-Madison
SAPC Pharma
Spectrum Research Inc.
Standard Process Inc.
Stratatech Corporation
Strategem Inc.
Target Corporation
ThermoFischer Scientific
United States Department of Agriculture
University of Wisconsin Hospitals and Clinics
Virtual Care Provider Inc.
WCG Research Institute
Wisconsin Alumni Research Foundation
Wisconsin Entrepreneur’s Network
Wytch Pharmaceuticals
Program Specifics

When and Where
Designed to meet the needs of working professionals, the two-year M.S. in Biotechnology curriculum integrates classroom material with day-to-day work challenges. Convenient evening and weekend sessions enable students to achieve a world-class degree from UW-Madison while working full-time.

- Classes meet every other week on Thursday evening, all day Friday and Saturday morning.
- All courses are held in the state-of-the-art MG&E Innovation Center of University Research Park and the Biopharmaceutical Technology Center Institute on the southwest edge of Madison.
- Students accepted in the program agree to attend at least 14 class sessions each academic year in these locations.
- We provide customized services to help students balance education with their work and personal lives.
- All materials are available online—and IT technical support is available.
- Personalized career consultation helps students develop and meet their strategic career goals.

Admission
The M.S. in Biotechnology program is currently seeking applicants to begin studies in the fall semester. To be considered, you’ll need:

- A four-year bachelor’s degree or equivalent academic credentials, with a minimum of two semesters of biology or other related life science courses
- Relevant industry experience and/or project work
- Three letters of recommendation
- A personal or phone interview with the Admissions Committee

The application deadline for fall admission is March 31, with interviews held with selected applicants. The M.S. in Biotechnology uses a rolling admissions process and may close the class before March 31 if all slots are filled. If spaces remain after March 31, the Admissions Committee will consider applications received later. Because each class is limited to 30 students, applying early increases your chances of being admitted. You’ll find the forms and information you need to apply at ms-biotech.wisc.edu.

Tuition and Fees
Tuition for the two-year M.S. in Biotechnology program is $31,500. This total does not include books or software, most of which are available in educational versions at substantial discounts. We encourage students to use personal laptops for courses and team-based assignments. Tuition adjusts annually, so please visit ms-biotech.wisc.edu or contact the program office for up-to-date tuition and fee information.
BIOTECHNOLOGY AT THE UNIVERSITY OF WISCONSIN-MADISON

The University of Wisconsin-Madison’s highly diverse concentration of bioscience expertise makes it a world leader in biotechnology, life science and medical research. Each year, the university spends more than $1 billion on research—an investment that ranks second among U.S. public universities—and generates results with far-reaching impact. From life-saving drugs that reduce high blood pressure to improvements in radiation therapy for cancer and a better solution for storing human organs awaiting transplant, UW-Madison technologies are improving health and health care worldwide.