PROFESSIONAL EDUCATION

PROFESSIONAL CERTIFICATE PROGRAM IN

BIOTECHNOLOGY & LIFE SCIENCES

MESSAGE FROM THE DIRECTOR

Today's professionals are tasked with solving high-stakes challenges while navigating exponential data growth, ever-changing technology, and the demands of an increasingly global market. At MIT Professional Education, we know that the advancements required to answer these problems amid a shifting landscape cannot be made in isolation. That's why our Short Programs courses and certificates are dedicated to connecting industry practitioners with real-time, proven strategies from MIT across a variety of timely topics—from machine learning and biotech to innovation and manufacturing.

In our Professional Certificate Program in Biotechnology & Life Sciences, you'll join a global community of lifelong learners committed to applying technical knowledge for the betterment of humankind. Designed and led by MIT experts, the certificate is a living, breathing credential that is constantly evolving to meet the latest industry trends and market demands. Whether you're looking to incorporate AI strategies into your product development pipeline, transform fundamental manufacturing systems, or speed up your analysis capabilities,at MIT you'll find the insights you need to upskill your career and make a positive impact—on your organization, your industry, and the world.

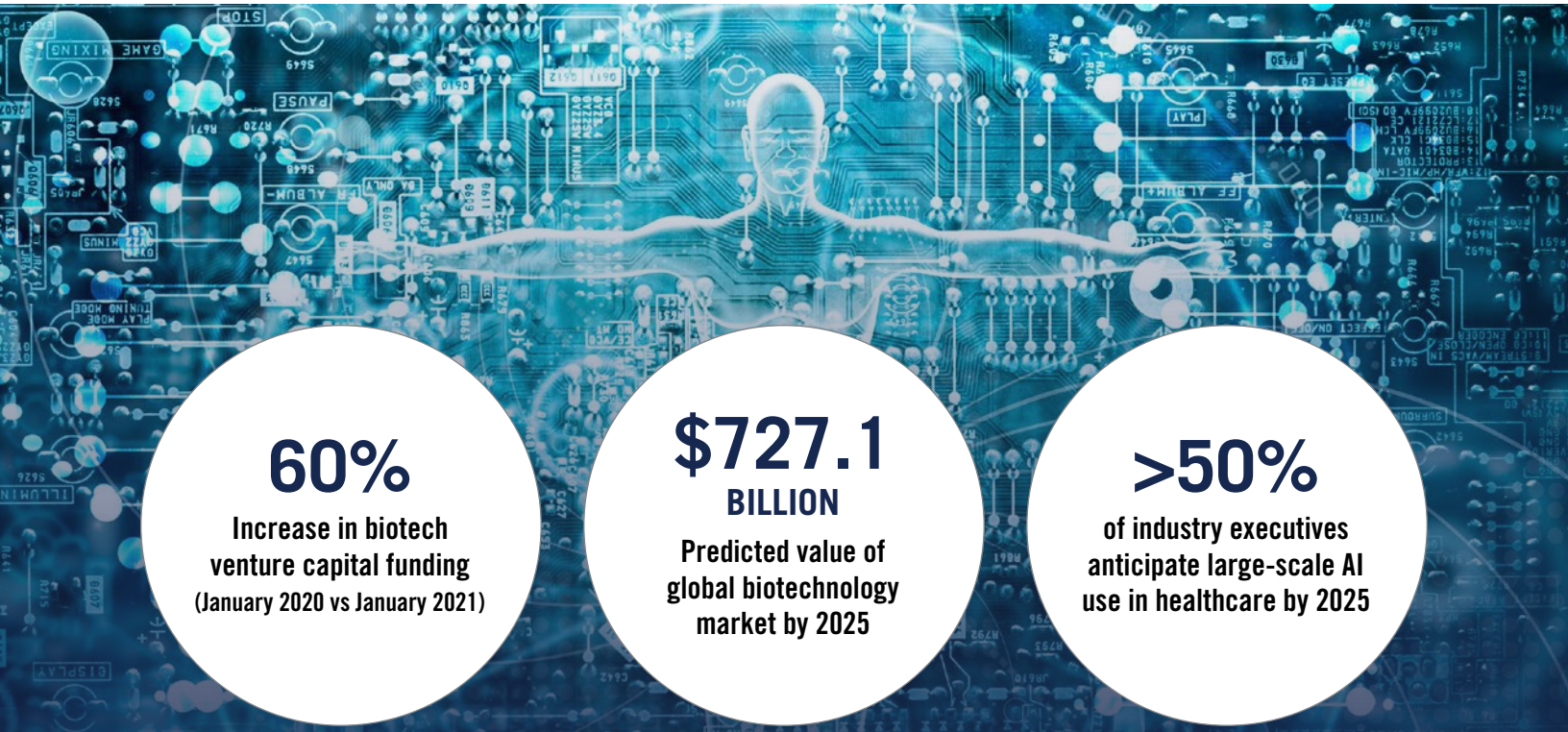
We hope you'll join us as we push the boundaries of what's possible in biotechnology and life sciences together. Your next chapter is waiting.

Sincerely,

Malgorzata Hedderick
Director, Short Programs

WHY IT MATTERS

The world recently witnessed some of the fastest development of major pharmaceuticals in history, from research through distribution. The result? Consumers now hold higher expectations for organizations in biotechnology and related industries, requiring professionals at every stage of the development cycle to operate at the highest standards.



60%
Increase in biotech venture capital funding
(January 2020 vs January 2021)

$727.1 BILLION
Predicted value of global biotechnology market by 2025

>50%
of industry executives anticipate large-scale AI use in healthcare by 2025

SOURCES:
https://www.mckinsey.com/industries/life-sciences/our-insights/whats-ahead-for-biotech-another-wave-or-low-tide
https://seedscientific.com/biotechnology-statistics/

"Because this course offers such a broad range of applications, professionals of any experience level can get a lot out of it."

Eric Johnson, President, JSR Micro

CORE INSTRUCTORS

CHARLES L. COONEY
Robert T. Haslam Professor Emeritus in Chemical Engineering, MIT

BAZARRAGCHAA DAMDINSUREN, MD, PHD
Product Quality Team Leader, Office of Biotechnology Products, Office of Pharmaceutical Quality, CDFER , FDA

MARK MANNING
Chief Scientific Officer, Legacy BioDesign

KRISTALA L. JONES PRATHER
Arthur D. Little Professor of Chemical Engineering, MIT; Investigator, Synthetic Biology Engineering Research Center

BERNHARDT L. TROUT
Raymond F. Baddour, ScD (1949) Professor of Chemical Engineering, MIT

Instructor research areas:

- Biopharmaceutical quality control
- Protein formulation
- Biotherapeutic design and manufacturing
- Cardiovascular diagnostic and therapeutic technologies
- Machine learning and AI applications in healthcare
- Sensor systems and real-time industrial monitoring
- Nanotechnology applications in medicine
- Organic semiconductors
- Neuroengineering and high-density neural implants
- Systems analysis and design
- Bioprocess analytics and life science informatics
- Laboratory design, compliance, and regulations

QUANTIFY RISK AND TRANSFORM EXISTING MARKETS

As biotechnology accelerates to meet emerging global needs, industry professionals are challenged to stay up-to-date on every aspect of the field, from process to product design. In the MIT Professional Certificate Program in Biotechnology & Life Sciences, you'll acquire the knowledge you need to stay current—and get ahead—in the ever-changing world of biotechnology. Our professional certificate program can help you engineer the next blockbuster pharmaceutical, apply the latest artificial intelligence tools to healthcare, or redesign fundamental agricultural processes.

The course instructors were brilliant. Their real-world examples and analogies made complex topics much easier to understand.

Amy Irvin, Pfizer

Solve pressing challenges related to:

- Biochemical Processing
- Biotherapeutics
- Emerging Technologies
- Data Collection and Analysis
- COVID-19 and Future Pandemics
- And More

LEARNING OUTCOMES

- Acquire practical hands-on experience testing the latest theoretical and research-based knowledge
- Develop proficiency in the three fundamental aspects of biotechnology product and process design
- Learn to apply cutting-edge technology to your own business challenges
- Gain valuable insights from renowned MIT faculty and leading industry experts
- Network with an accomplished group of peers from around the globe
- Earn Continuing Education Units

HOW IT WORKS

In this prestigious certificate program, you'll complete 16 days of qualifying Short Programs courses within 36 months, which must include the three core courses, and may include up to one elective. These courses will help you target the skills most relevant to your personal goals, equipping you with the cutting-edge strategies you need to get ahead and stay ahead.

TEACHING METHODOLOGY

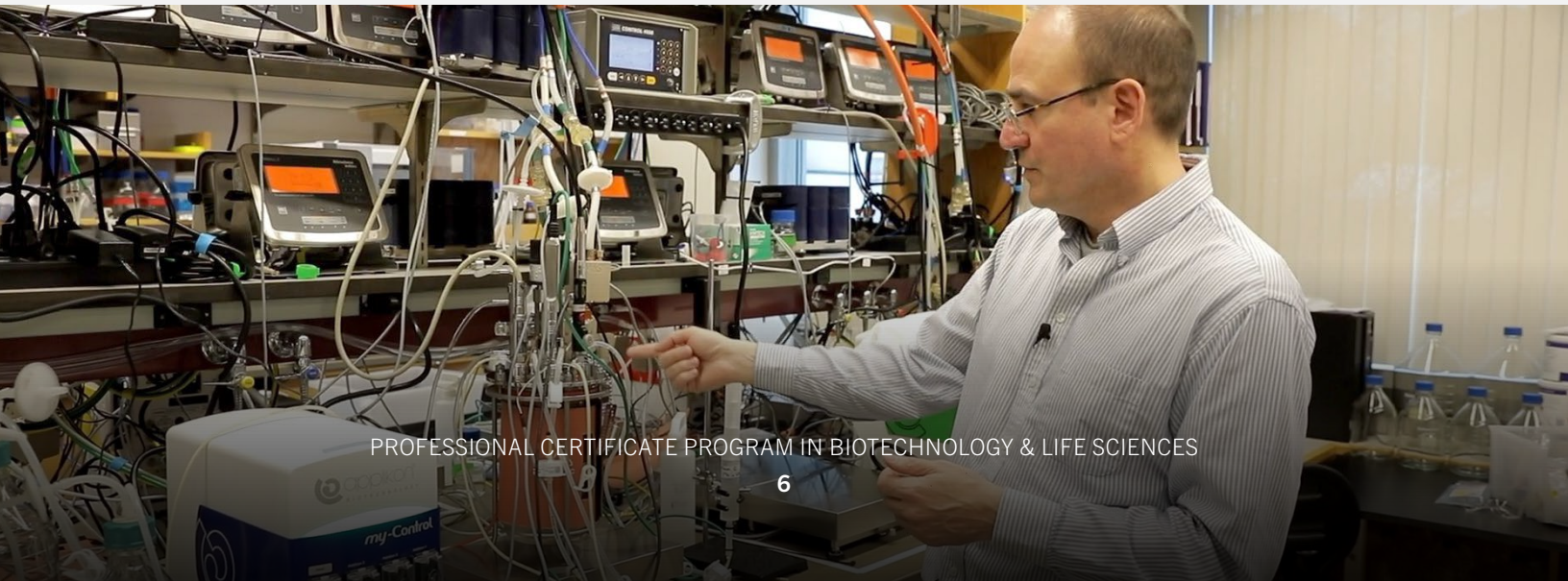
The certificate curriculum is grounded in the spirit of MIT's motto, "Mens et Manus," or "mind and hand," which combines theoretical instruction with hands-on methods of discovery.

Interactive Lectures

Hands-on Exercises

Group Projects

Supplemental Resources



CORE COURSES

Formulation and Stabilization of Biotherapeutics

4 DAYS | BERNHARDT L. TROUT, MARK MANNING

Gain greater insight into biotherapeutics and how to manage their intrinsic chemical and physical instabilities.

Downstream Processing

5 DAYS | CHARLES L. COONEY

Understand the fundamentals of downstream processing and gain new strategies for biochemical process analysis and synthesis.

Fermentation Technology

5 DAYS | KRISTALA L. JONES PRATHER

Discover how to apply biological and engineering principles to problems involving microbial, mammalian, and biological/biochemical systems.

ELECTIVE COURSES

Nanoscience and Nanotech: Industrial Application and Transformation

3 DAYS | BRIAN ANTHONY, VLADIMIR BULOVIĆ

Gain an intellectual framework for thinking about, applying, and commercializing the power of the nanoscale for industrial purposes.

Machine Learning for Healthcare

3 DAYS | DAVID SONTAG

Learn to apply the latest advances in healthcare AI tools and techniques.

Persuasive Communication Bootcamp

4 DAYS | EDWARD SCHIAPPA

Enhance your communications skills and attain greater professional success by improving your public speaking, critical thinking, and data visualization abilities.

Bioprocess Data Analytics and Machine Learning

3 DAYS | RICHARD D. BRAATZ, BRIAN ANTHONY, SEONGKYU YOON

Discover transformative ways to apply data analytics and avoid the most common pitfalls that arise when analyzing bioprocess data.

Foundations of Data and Models: Regression Analytics

5 DAYS | F. DALE MORGAN

Learn how to fit data to different types of models using linear algebra and computational methods.

Engineering Leadership for Emerging Leaders

5 DAYS | DAVID NIÑO, REZA RAHAMAN

Develop the leadership skills you need to mobilize colleagues to pursue a shared vision, solve problems through teamwork, and motivate people to deliver their best results.

WHO SHOULD ATTEND

The Professional Certificate Program in Biotechnology & Life Sciences is designed for learners with at least three years of professional experience and a bachelor's degree (at a minimum) in a technical area. Professionals who will find the curriculum useful include:

- **Engineers and scientists** who need advanced knowledge and skills for engineering the next breakthrough biotechnology innovation
- **Biologists, chemists, and microbiologists** seeking next-level insights in areas such biotherapeutics, downstream processing, and fermentation technology
- **Executives and other leaders** seeking the latest information on industry trends and best practices to help inform their business strategies and investments
- **Managers** who oversee teams in the biological sciences and need an in-depth understanding of the latest developments in the field
- **Attorneys** who practice in areas pertinent to biotechnology, such as patent, pharmaceutical, regulatory, and contract law, and need to understand evolutions in the industry to more effectively advise their clients
- **Entrepreneurs** looking to understand and capitalize on emerging opportunities in biotechnology

SAMPLE LEARNING PATH: **PHARMACOLOGIST**

- **Formulation and Stabilization of Biotherapeutics** 4 DAYS
- **Downstream Processing** 5 DAYS
- **Fermentation Technology** 5 DAYS
- **Engineering Leadership for Emerging Leader** 5 DAYS

SAMPLE LEARNING PATH: **BIOTECH VENTURE CAPITALIST**

- **Formulation and Stabilization of Biotherapeutics** 4 DAYS
- **Downstream Processing** 5 DAYS
- **Fermentation Technology** 5 DAYS
- **Nanoscience and Nanotech: Industrial Application and Transformation** 3 DAYS
- **Machine Learning for Healthcare** 2 DAYS

ALUMNI BENEFITS

As an MIT Professional Education Professional Certificate Program alumnus you will receive:

- A 15 percent discount on future MIT Professional Education courses
- Invitations to special events, networking opportunities, and future courses
- Updates on faculty research, new programs, and MIT initiatives via our newsletter
- Membership in the exclusive MIT Professional Education Alumni Group on LinkedIn
- Continuing Education Units (CEUs) for each eligible course

PROFESSIONAL EDUCATION
Short Programs

This is to certify that

Your Name Here

has successfully completed

Professional Certificate Program in Biotechnology & Life Sciences

Bhaskar Pant
Executive Director
MIT Professional Education

Upon successful completion of this program, you will receive an official certificate presented during the final day.

HOW TO APPLY

1. Explore the Biotechnology & Life Sciences Professional Certificate program at **professional.mit.edu/biotech**.
2. Determine which course options align most closely with your professional goals.
3. Submit an application for the program on our website.
4. Pay the non-refundable $325 application fee.
5. Watch your email—you will receive an admissions decision within two to three weeks from shortprograms@mit.edu.
6. Once accepted into the program, you will be invited to apply for individual courses.

APPLY TODAY AT
professional.mit.edu/biotech

PROFESSIONAL EDUCATION

ABOUT MIT PROFESSIONAL EDUCATION

For 70 years, MIT Professional Education has been providing technical professionals worldwide a gateway to renowned MIT research, knowledge, and expertise, through advanced education programs designed specifically for them. In addition to industry-focused, two-to-five-day live virtual and on-campus courses through Short Programs, MIT Professional Education offers professionals the opportunity to take online and blended learning courses through Digital Plus Programs, attend courses abroad through International Programs, enroll in regular MIT academic courses through the Advanced Study Program, or attend Custom Programs designed specifically for their companies. For more information, please visit **professional.mit.edu**.

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