

# PROFESSIONAL MASTER OF ENGINEERING PROGRAM

## Biomedical Engineering Concentration



**bioengine**

BIOENGINEERING INNOVATION & ENTREPRENEURSHIP

“The medical devices industry is one of the most important and rapidly expanding industries in the healthcare, cutting costs, improving patient outcomes, and saving lives. The global medical device technology market will be worth USD 465.5 billion and grow to USD 591.3 billion by 2027.

*Gyan Consulting (2023)*

“Given the amount of medical device and diagnostic equipment companies in Orange County, CA ... life sciences has now become the largest industry in the market.”

*Rebusiness Online (2023)*

“The average wages per worker in Orange County’s life science industry is \$108,000 annually.”

*BIOCOM California’s 2023 Life Science Economic Impact Report*



### Program Overview:

The University of California, Irvine (UCI) Professional Master of Engineering (M.Eng) program’s Biomedical Engineering Concentration, also known as BioENGINE (BioEngineering, Innovation, & Entrepreneurship), is designed to provide rigorous and practical hands-on team-based training in biomedical innovation, entrepreneurship/intrapreneurship, and commercialization. BioENGINE will train students through experiential learning to become experts and leaders in developing biomedical devices and technologies.

### Program Features:

- 3-course sequence focused on the innovation, building, and launching of a medical technology business.
- Dedicated staff and seminar course to facilitate job searches, industrial networking, and professional career development.
- Students choose 6 technical courses on timely, relevant biomedical engineering topics, taught by experts in the field.
- 2-quarter Capstone design course where interdisciplinary student teams design, build, and test new medical technology, with faculty and industry mentors.
- Regularly interact and network with industry through symposia, lectures, design projects, and company site visits.
- Earn a Master of Engineering degree from UCI in as soon as 9 months.



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### FALL

Entrepreneurship,  
Leadership

Professional  
Development Seminar

Technical Core

Technical Elective

### WINTER

Entrepreneurship,  
Leadership

Professional  
Development Seminar

Technical Core

Technical Elective

Capstone Project\*

### SPRING

Entrepreneurship,  
Leadership

Professional  
Development Seminar

Technical Core

Technical Elective

Capstone Project\*

### SUMMER/FALL (optional)

Capstone Project\*

### Engineering Leadership (3 quarters/12 units):

Topics include: product ideation, design, manufacturing, and marketing, writing proposals and business plans, successful team building, project management, revenue generation, intellectual property, and regulatory issues.

### Technical Core Courses (1 per quarter\*):

BME 201P Biomedical Big Data    BME 202P Biomedical Imaging & Photonics  
BME 295P Functional Medical Device Development (including regulatory affairs)

### Technical Elective Courses (1 per quarter\*):

BME 210P Molecular and Cellular Engineering  
BME 251P Engineering Medical Optics  
BME 295P Intro to Machine Learning  
BME 295P Personalized Medical Devices

BME 221P Quantitative Physiology: Organ Transport Systems  
BME 233P Dynamic Systems in Medicine and Biology  
BME 240P Intro Clinical Medicine for Biomedical Engineering  
BME 295P Fabrication of Biomedical & Wearable Microdevices

\* Course offerings subject to change

### Capstone Project (\* 2 quarters/ 8 units):

Hands-on design project where teams of students, mentored by faculty and industry representatives, will:

- Perform competitive analysis and develop market entry strategies towards new product commercialization.
- Define FDA design control requirements and product specifications; determine optimal solution.
- Design, fabricate, and test a prototype in UC Irvine's world class facilities and laboratories.
- Present project results to faculty and industry at the end-of-term Project Showcase.
- Option to do project Winter/Spring or Summer/Fall.



Apply online: <https://meng.eng.uci.edu/>

Contact us: [gradengr@uci.edu](mailto:gradengr@uci.edu), (949) 824-8090

For more information, scan QR code



# PROFESSIONAL MASTER OF ENGINEERING PROGRAM

## Biomedical Engineering Concentration Capstone Design Projects



- Mentored by UCI faculty and medtech companies.
- Multidisciplinary teams, 4 – 5 students.
- 6 months duration
- Perform competitive analysis.
- Define optimal requirements and specifications.
- Develop implementation plan.
- Design, fabricate, and test a prototype.
- Present project results at year-end showcase.



### SAMPLE PROJECTS:

#### Traumatic Brain Injury Assessment System

Develop a low-cost, helmet-mounted sensor system to measure cranial impact during a bump or jolt to the head.

#### Pulsatile Stent Graft for Cardiovascular Disease

Design an actuating, low-power, wirelessly charged aortic stent graft to improve blood flow in the heart.

#### Portable Antibacterial Burn Wound Dressing Device

Design handheld device for contactless application of antibacterial nanofiber matrix for rapid wound healing at the point-of-care.

#### Wireless Smart Device for Knee Rehabilitation

Develop advanced camera system to expedite knee rehabilitation and preventative maintenance.

#### Pulsatile Aspiration for Ischemic Stroke Treatment

Develop algorithm that implements faster pulsatile clot aspiration for thrombectomy procedures.

### Past/Present Capstone Industry Mentors:

- Hoag Orthopedics
- Alcon
- Matrogenix
- Varian/Siemens Health
- Masimo
- Ossur
- Omnica Corporation
- Advantech
- MIVI Neuroscience
- Vena Vitals, Inc.
- Epinex Diagnostics
- PulseGraft
- Surgalign
- DepressiStim
- NextGen Port
- Mitsubishi

Access all  
Capstone  
projects:



[sites.uci.edu/mengprojects/](https://sites.uci.edu/mengprojects/)

## Gain Hands-on, Real World Experience.

# PROFESSIONAL MASTER OF ENGINEERING PROGRAM

## Biomedical Engineering Concentration Graduate Outcomes

“The BME M.Eng program taught me how to turn the technical aspects of engineering into successful products above and beyond the design and performance aspects of builds. I am much more confident in working towards launching products. I couldn't recommend the program more.”

*Rasheed Majzoub  
Applied Medical  
BME M.Eng, Class of 2023*

“UCI's BME M. Eng program provided a home for me to grow as an engineer and as an individual. The faculty and staff ensured that each student was successful and well equipped for the business world. I am confident in saying that the M.Eng program helped me get to where I am now.”

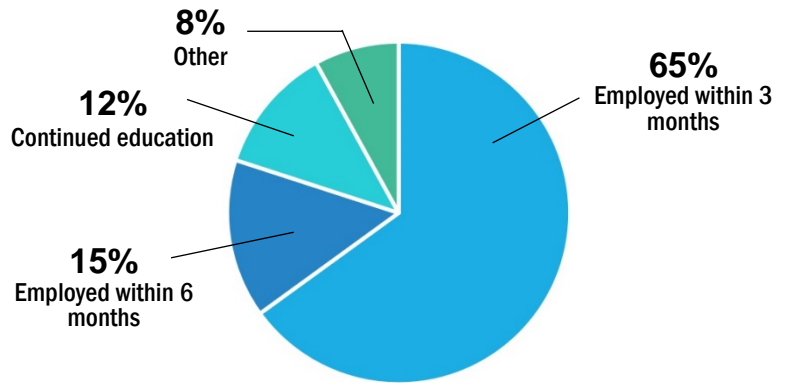
*Eric Ortiz  
Medtronic  
BME M.Eng, Class of 2022*

“BME M.Eng helped me secure a part time position at a diagnostics company that later became a full-time position post-graduation. The program fostered lasting connections with peers and mentors. The staff's ongoing support, career guidance, and mentorship exemplifies the program's commitment to the long-term success of its alumni.”

*Enrique Felix  
Teco Diagnostics Inc.  
BME M.Eng, Class of 2022*

### Employment Statistics

- 80% of graduates are employed within 6 months of graduation.
- 21% of BME M.Eng students work full time while in the program.
- Of those 21%, 86% were promoted after graduation.
- BME Concentration average annual base salary: \$108,000.



### Where are graduates employed?

- Applied Medical
- Alcon
- Advanced Sterilization Products
- Adona Medical
- Aureka Biotechnologies, Inc.
- Barry-Wehmler Design Group
- FUJIFILM Irvine Scientific
- Industrial Tech. Res. Inst. (ITRI)
- Precision Digital Health
- Edwards Lifesciences
- Glidewell
- Metagenomi
- MicroVention-Terumo
- MIVI Neuroscience
- ImmunityBio, Inc.
- DeviceLab Inc.
- DNA Electronics Inc.
- Teco Diagnostics Inc.
- Masimo
- Medtronic
- MdxHealth
- Pfizer
- Proteor
- SCAN US, Inc.
- Triton Bio, Inc.
- Vena Vitals, Inc.
- VivoSense, Inc.

### Job titles include:

Technical Product Manager, Research & Development Engineer, Regulatory Affairs Specialist, Global Product Development Engineer, Process Validation Engineer, Data Scientist, Biocompatibility Engineer, Manufacturing Engineer, R&D Clinical Engineer.