



# YALE UNIVERSITY MS IN PERSONALIZED MEDICINE + APPLIED ENGINEERING

*Enroll In Our Masters  
Degree Program!*

TAUGHT BY BOTH YALE SCHOOL OF MEDICINE  
AND YALE SCHOOL OF ENGINEERING  
& APPLIED SCIENCE FACULTY

**APPLY NOW!**

**Deadline  
December 15  
2023**



Visit [seas.yale.edu/pmae](https://seas.yale.edu/pmae) to schedule a virtual information session

#### PROGRAM'S MISSION STATEMENT:

TO PREPARE BIOMEDICAL, MECHANICAL AND ELECTRICAL ENGINEERS, COMPUTER SCIENCE MAJORS,  
PRE-MED STUDENTS, MEDICAL STUDENTS AND PHYSICIANS WITH THE TOOLS TO DEVELOP  
INNOVATIVE 3D SOLUTIONS FOR PERSONALIZED MEDICINE AND SURGERY



*A Medical and Engineering Collaboration!*

## WHAT YOU WILL LEARN

- 3D Technology to Address Surgical and Medical Conditions
- Practical Skills Through 8-Week Clinical Immersions Shadowing Clinicians Who Conduct Personalized Medicine
- Preoperative Surgical Planning and Custom 3D Printed Instrument Design
- The Production of XR Medical Education Tools
- Tissue Engineering and Manufacturing
- Diagnostic Image Analysis
- How to Develop Novel Diagnostics, Treatments, and Tools With a Dedicated Master's Thesis Project
- Emerging Technologies

## WHAT YOU WILL GET HANDS-ON EXPERIENCE WITH

- High-Resolution Medical Imaging
- Point of Care 3D Printing
- Robotics and Computer Navigation
- Extended Reality

## JOBS/OPPORTUNITIES YOU WILL BE PREPARED FOR

- Medical Device Design Engineer
- Manager at a Point of Care Printing Center
- 3D Medicine Research Scientist
- Engineer with Specialized Image Processing and 3D Modeling Skills
- Medical School with Robust Engineering Toolkit

## THE MANY DIFFERENT CLINICIANS YOU MAY SHADOW:

- Radiology
- Interventional Radiology
- Radiation Oncology
- General Surgery
- Orthopaedic Surgery
- Hand and Upper Extremity Surgery
- Total Joint Surgery
- Trauma Surgery
- Spine Surgery
- Sports Medicine
- Cardiology
- Electrophysiology
- Pain Management/Block Service
- Vascular Surgery
- Ear, Nose and Throat Surgery
- Anesthesia
- Regional Anesthesia
- Pediatric Critical Care Medicine
- Neurosurgery
- Neurology
- Neuro Intensive Care
- Dermatology
- Emergency Medicine
- Pulmonary Critical Care
- Urology
- Oncology
- Hematology
- Surgical Intensive Care
- Medical Physics



## THE RANGE OF MASTERS THESIS PROJECTS PREVIOUS STUDENTS WORKED ON:

- Brain Tumors: MRI Based 3D Volumetric Analysis of Neurofibromatosis Type 2
- Vestibular Schwannomas: Development of a Diagnostic and Visualization Tool
- Cardiology: Applying Machine Learning to Predict Heart Age
- Orthopaedics: Developing a Bone Density Algorithm from CT Scans and X-Rays for Total Knee Arthroplasty
- Vascular Surgery: 3-Dimensional Modeling from Ultrasound of Arteriovenous Fistulas Used for Hemodialysis
- Tissue Engineering: Application of a 3D-Bioprinter: Jet Technology for “Biopatch” Development Using Cells on Hydrogel Supports
- Lung Cancer: A Lung Segmentation Tool For Surgical Planning of Sublobar Pulmonary Resections
- Orthopaedics: Mechanical Effects of Different Fulcrums on Balanced Cable Bone Segment Transport

## JOBS THAT PREVIOUS GRADUATES FOUND:

- Medical Device Industry
- Tissue Engineering
- Research Lab
- 3D Printing Lab
- Medical School

## QUOTES FROM CURRENT STUDENTS:

“*The clinical aspect and shadowing really made this program different from other programs that are just course-based; the focus on virtual surgical tools and 3D printing for clinical engineering applications was unique compared to other top BME programs.*”

“*The length of the program allowed me to apply to medical school. I really enjoyed the clinical immersion rather than solely an engineering approach like many other programs. There is a collaborative nature with the hospital, the clinical environment and the research labs. The program was flexible to align with my personal interests and goals, but with enough structure that I felt well supported. We have tremendous access to Yale mentors, school resources, and the opportunity to network.*”

“*As a hopeful physician-scientist, I wanted to garner an engineering background in addition to my biology experience to be able to provide better service in healthcare. As I was looking for biomedical engineering Masters programs, I noted that the Yale PMAE program explicitly merged practical clinical application with patient care.*”

## Questions?

### CONTACT:

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