What is Engineering?

Engineering is essentially

“Integrating all available knowledge for a purpose”

ABET accredited since 2001
Our Mission

To develop the tools, techniques and talent to promote health and quality of life through education, research and innovation that integrates engineering and life sciences in a global context

You are the TALENT !!!
THE DREXEL DIFFERENCE

FACULTY

CO-OP

RESEARCH OPPORTUNITIES

PENNONI HONORS COLLEGE

BME LIVING COMMUNITY

DUAL DEGREE (BS/MS) (BS/MD)
Dual Degree Programs

- **BS/MS Program:**
  - Earn BSBE and MS degrees
  - 5-year program
  - 3.4 GPA requirement

- **BS/MD Program:**
  - Earn BSBE and MD degrees
  - 4 years for BSBE + 4 years for MD
  - Admissions level entry only
  - 3.6 GPA requirement
BS/MS – Combined Bachelor’s and Master Degrees

- BSBE (only): 459 (86%)
- BSMS: 74 (14%)
Geographic Representation

- **Domestic – 91%**
  - 24 states – California to Maine & Puerto Rico
  - PA and NJ – 70%

- **International – 9%**
  - 19 Countries – Vietnam to Jamaica
  - China and India – 3%
Undergraduate Population - Gender

Total 533

Female: 292 (55%)
Male: 241 (45%)
Students Tackling Advanced Research (STAR):
Summer of First Year
*international option

Senior Design: Capstone Design Project
*must be tested

Independent Study Research:
For academic credit

BS/MS Program: Master’s Thesis Research

#newdragons
Car Seat Motion Sled

Sri Balasubramanian, PhD
Bioimaging - Breast Cancer Detection

Wan Shih, PhD

iBreastExam (iBE™)
2019 Senior Design – Grand Prize Winners

Mid-Fidelity Simulation Model for Training Cesarean Sections in Kampala, Uganda

Rachel Junod, Michelle Krach, Lyndsey Sbarro, Victoria Utria
Advisors: Michele Marcolongo, PhD & Owen Montgomery, MD

Need: Uganda has a shortage of physicians trained in cesarean section (CS) leading to high maternal mortality

Objective: Create an accurate CS training model to improve accessibility and quality of training

Design Needs:
- Anatomically Accurate
- Mechanically Accurate
- Low Cost ($1/use)

Doctor: Patient Ratio
1:24,725

Maternal Mortality
343 in 100,000

Solution: Silicone model with removable, interlocking components for part task training and multiple uses

Approach:

Material Selection
Tensile Tests

Model Design

Physician Testing & Feedback

Prototypes

Results: Although some mechanical requirements were not met, physician stakeholders approved the model

Component | Mechanically Accurate | Physician Approved
---|---|---
Skin | | ✓
Fat | ✓ | ✓
Muscle | ✓ | ✓
Uterus | | ✓

Impact:
Access to affordable, accurate training worldwide

#newdragons
2019 Senior Design – Grand Prize Winners
Test drive your career with cooperative education
Top Coop Employers

- Johnson & Johnson
- Drexel University
- Glaxo SmithKline
- Avid Radiopharma
- CHOP
- Merck
- Fox Chase Cancer
- Globus Medical
Fall 2018-19 Coop Salary

Six Month Salary

- Average ~ $18,000
- Low ~ $7,200
- High ~ $38,400
The value of a Drexel degree
Degree Awards 2019

- Bachelor's: 61 (38%) of 160 Total
- Master's: 93 (58%) of 160 Total
- PhD: 6 (4%) of 160 Total
# Career Opportunities Beyond Graduation

## Industry
- Medical Devices & Systems
- Product Development
- Quality Management
- Biopharmaceuticals
- Biotechnology

## Graduate Studies
- Technology Innovation and R&D
- Technology Management
- Academic & Research Positions

## Professional Studies
- Medical School
- Dental School
- Veterinary School
- Law School
- Business School

## Public Service
- Regulatory Administration (FDA, OSHA)
- Local and National Government Agencies (DOD, NASA)
- Civil Service (NGO)
Engineering the BME Experience
The Drexel BME Curriculum

Concentrations and Senior Design

Biomedical Engineering Design and Modeling

E
T
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C
A
L

Mathematics
BioMaterials
Biology
BioMechanics
BioSignals
Communication
Computation
General Studies

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Ethics

*How to Defeat Your Own Clone: and other tips for surviving the biotech revolution*
Kurpinski, K. and Johnson, T.D.

“One last word of caution before challenging your clone to a showdown: have you considered the possibility that YOU are the clone?”

http://www.howtodefeyourownclone.com/
What is needed for your BME degree?

Drexel Engineering Core Curriculum (DECC)
- Calculus
- Diff Eq
- Linear Algebra
- Physics
- Chemistry
- Biology
- ENGR – Design Lab
- ENGR- CAD
- Thermodynamics
- Materials

BME Core
- BME Seminar
- BME Design & Problem Solving
- Programming & Modeling
- BME Labs
- Physiology
- Statics
- Electric Circuits
- Dynamics
- Controls Systems
- Mass Transport
- Fluid Flow
- Bio-materials
- Bio-simulation
- BME statistics

Humanities Reqs
- English
- UNIV 101
- Ethics and Law
- History of Technology
- Liberal Studies
  - 5 Electives
  - Writing Intensive*

Concentration Reqs
- Engineering Reqs
- Science Reqs
- Senior Sequence
- Senior Design
- Thesis (BSMS)
- COOP
# Drexel Co-op Program

## 5 Year, 3 Co-op Cycle

<table>
<thead>
<tr>
<th></th>
<th>Fresh</th>
<th>Soph</th>
<th>Pre-Jr</th>
<th>Junior</th>
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# Drexel Co-op Program

4 Year, 1 Co-op Cycle

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Biomedical Engineering at Drexel

Integrating Life Sciences and Engineering

- Biomedical Informatics (BMI)
- Biomechanics & Human Performance (BHP)
- Biomedical Devices and Imaging (BDI)
- Neuro-Engineering (NEUE)
- Biomaterials Engineering (BMAT)
- Tissue Engineering (TE)
Biomedical Devices & Imaging

Drexel University
School of Biomedical Engineering, Science and Health Systems
Biomechanics & Human Performance
Neuroengineering
Tissue Engineering

Synthetic Skin

If Tissue Engineering Can Get Past the Start-up Woes, Replacement Livers, Bones, and Blood Vessels Are Next
The Biomed Family
The Biomed Family
Capstone design experience.

Team projects to produce a prototype design.

Three quarters (30 weeks) of the senior year.

The Biomed Family
The Biomed Family
Your first steps to this!

The Biomed Family

#newdragons

Visit us on the web at BIOMED.DREXEL.EDU
#drexelVisit
Thank you for visiting Drexel University

For more information, visit biomed.drexel.edu