Bioengineering Information Session

Profs. W. Sutton and N. Peixoto

Q & A to follow

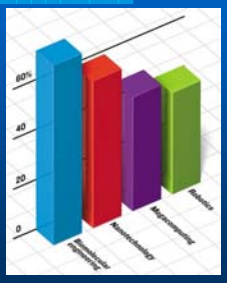
October 24th, 4:30pm, room 320 of STII

Bioengineering Track for Electrical Engineering

A new Bioengineering Track for Electrical Engineering has been established. Following the Electrical Engineering curriculum closely, the track focuses on bioinstrumentation. Students in the track will gain familiarity with living systems, and the challenges of taking measurements from such systems.

This will be a fifth track, joining: Computers; Comm/Signal Processing; Controls; Electronics

Technology Trends Societal Impact



Interview with IEEE Fellows in IEEE Spectrum October 2005

Requirements (and Dr. Peixoto)

Delete	Add
PHYS 262/263 (4)	BIOL 213 (4) Cell Structure and Function
ECE 201 (3)	BENG 201 (3) Intro. to Biomedical Signals
ECE 460 (3)	BENG 401 (4) Bioengineering Instrumentation
	BENG 402 (1) BioE Instrum. Lab
ECE 492 (1)	BENG 492 (2)
ECE 493 (2)	BENG 493 (2)
ECE Advanced Lab (1)	BENG Advanced Lab (1)
ECE Tech Elective (3)	BENG Tech Elective (3)
ECE Tech Elective (3)	
ECE Tech Elective (3)	BENG Tech Elective (3) or BIOL 425 (3)

Sample Schedule – Years 1-2

Freshman

MATH 113	MATH 114
ENGR 107	ECE 101
CS 112	CS 222
ENGL 101	PHYS 160
ECON 103	PHYS 161

Sophomore

MATH 213	MATH 214
MATH 203	**BIOL 213** (4)
BENG 201	ECE 220
PHYS 260	ECE 280
PHYS 261	
Literature	

Sample Schedule – Years 3-4

Junior

ECE 320	**BENG 401** (4)
ECE 331	**BENG 402** (1)
ECE 332	ECE 433
ECE 333	**BENG Tech.Elec.**
ECE 334	COMM 100
STAT 346	
Fine Arts Gen Ed	

Senior

BENG 492 (2)	**BENG 493**
ECE 491	**BENG Adv.Lab**
BENG Tech.Elec.	ECE 421
ECE 305	ECE 445
ENGL 302	HIST 100
Global Gen Ed	
ECE Adv. Eng. Lab	

What next?

- Start courses based on the published information.
- Selected ECE courses (499, 590) will satisfy BENG Technical Elective Requirements.
- Department will formalize the Track with Student Records.
- Department will create BENG courses.
- When notified, come to ECE Department to complete a "Change of Major" form to declare the Track.
- Watch the BioE Track web site for details, updates and additional information.

As a bioengineer (or a biomedical engineer), you will:

- Have fundamental knowledge in science and engineering.
- Have the ability to apply engineering principles to define and solve problems in engineering and medicine.

Your homework: what won't you be able to do?

What is bioengineering?

(can you first define Electrical and Computer Engineering?)

- Application of engineering tools to investigate biological systems,
- Application of biological tools to understand engineering concepts.

What is "bioengineering at Mason"?

- Subset(s) of all bioengineering.
- The focus of Bioengineering is dictated by the research interests of the faculty.
- As of Jan'08, the two areas we cover are:
  - Neural Engineering
  - Ultrasound

What is the BENG track about?

- Focus on "Bioinstrumentation"
  - Development of prosthetic devices;
  - Measurement of physiological variables;
  - Design of biomedical engineering projects;
  - Processing of biological signals;
  - Sensors/actuators;
  - *Very hands-on!!!! You will learn how to make PCBs, how to do-it-on-your-own, how to think AND do.*

Will bioengineers find jobs?

Biomedical engineers *are expected to have employment growth that is much faster than the average for all occupations through 2014.* The aging of the population and the focus on health issues will drive demand for better medical devices and equipment designed by biomedical engineers. Along with the demand for more sophisticated medical equipment and procedures, an increased concern for cost- effectiveness will boost demand for biomedical engineers, particularly in pharmaceutical manufacturing and related industries. However, because of the growing interest in this field, the number of degrees granted in biomedical engineering has increased greatly. Biomedical engineers, particularly those with only a bachelor's degree, may face competition for jobs. Unlike the case for many other engineering specialties, a graduate degree is recommended or required for many entry-level jobs.

[From the Occupational Outlook Handbook, 2006-07 Edition]

Links and resources:

- Biomedical Engineering Society: http://www.bmes.org/
- IEEE Eng. in Medicine and Biol. Soc: http://www.embs.org/
- Bioengineering at Mason website: http://bioengineering.gmu.edu
- Nathalia's lab (Neural Engineering): http://complex.gmu.edu/people/peixoto

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Suggestions (while we wait for your questions)…

- Start soon: go find what you want to do (be it BENG or not BENG).
- Talk to your adviser – (s)he will help you!
- Get involved in ***research***: either get an internship, an apprenticeship, volunteer in a lab you are interested in (check out all research pages of faculty!), LEARN outside the classroom!

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