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

PHYS 262/263 (4)

Add

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

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)

BENG Tech Elective (3) or BIOL 425 (3)

Sample Schedule – Years 1-2

Freshman

MATH 113

ENGR 107

CS 112

ENGL 101

ECON 103

Sophomore

MATH 213

MATH 214

BENG 201

PHYS 260

PHYS 261

Literature

Sample Schedule – Years 3-4

Junior

ECE 320

ECE 331

ECE 332

ECE 333

ECE 334

STAT 346

Free Arts Gen Ed

Senior

BENG 492 (2)

ECE 491

BENG Tech Elect

ECE 305

ENGR 312

Global Gen Ed

ECE Adv. Eng. Lab

BioE_Info_Session
**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?

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**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. Moreover, 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/](http://www.bmes.org/)
- Bioengineering at Mason website: [http://bioengineering.gmu.edu](http://bioengineering.gmu.edu)
- Nathalia’s lab (Neural Engineering): [http://complex.gmu.edu/people/pajxolo](http://complex.gmu.edu/people/pajxolo)

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!