Presentation Overview

- Introductions
- Overview of Bioengineering and Bioinformatics Majors
- Academic Advising & Support
- Getting Started: What to Take in Fall 2014
- What’s Next
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Introductions: BSOE Undergraduate Advising and Student Affairs Staff

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Start Making Connections Now!

Turn to the person next to you

- Name
- Where you’re from
- Your college
- Your favorite video game or movie
- Plans for the rest of summer
All BSOE Undergraduate Majors and Programs

Applied Math & Statistics (2 minors)
Bioengineering (BS)
Bioinformatics (BS, BS/MS, minor)
Computer Engineering (BS, BS/MS, minor)
Computer Game Design (BS)
Computer Science (BA, BS, minor)
Electrical Engineering (BS, minor)
Network and Digital Technology (BA)
Robotics Engineering (BS)
Technology and Information Management (BS, minor)
Engineering & Computing Cluster
Overview of Bioengineering (BENG) and Bioinformatics (BINF)

- Bioengineering and Bioinformatics majors
- Career paths
- Research
- Getting Started
Bioengineering Major

- Interdisciplinary
  - Take courses from several different departments.

- Four concentrations
  - Biomolecular
  - Bioelectronics
  - Assistive Technology: Motor
  - Assistive Technology: Cognitive/Perceptual
Biomolecular Concentration

- The Biomolecular engineering concentration is designed for students interested in protein engineering, stem cell engineering, and synthetic biology.

- The emphasis is on designing biomolecules (DNA, RNA, proteins) and cells for particular functions, and the underlying sciences are physics and anatomy.
Bioelectronics Concentration

- This concentration is designed for students interested in the interface between organisms and electronic instrumentation or implants.

- The emphasis is on the interfacing of biological sensors to computer systems, and the underlying sciences are physics and chemistry.
Assistive Technology: Motor Concentration

- The assistive technology: motor concentration is designed for students interested in helping people with movement disabilities.

- The emphasis is on designing exoskeletons and robots, and the underlying sciences are physics and anatomy.
Assistive Technology: Cognitive/Perceptual Concentration

- This concentration is designed for students interested in helping people with cognitive or perceptual disabilities.
- The emphasis is on designing computer systems that help people compensate for disabilities, and the underlying sciences are psychology and computer science.
Bioengineering and other majors

- Biomolecular concentration vs MCD Biology
  - More math and statistics requirements
  - Biology: How the world works
  - Engineering: How to make it work the way you want

- Bioelectronics concentration vs Electrical Engineering
  - Electrical Engineering – More electrical
  - Bioelectronics – Broader (more science courses)
Bioengineering and other majors

- Assistive Technology: Motor vs Robotics
  - Biology background
  - Additional statistics courses
  - Using Robotics to assist people with movement disabilities
- Assistive Technology: Cognitive/Perceptual vs Psychology
  - Chemistry, Biology, Programming and Physics background
  - Desire to pursue Engineering but have an interest in Psychology
Careers

- Biomolecular Concentration:
  - Technician level positions.
  - Sales and Marketing for Bio-Tech companies.
  - Graduate School.

- Bioelectronics, Assistive Tech: Motor and Cognitive Concentrations:
  - Jobs in their field of research.

- Biomolecular tends to be more graduate school focused and other concentrations are more career and job focused.
Research

- Lots of research opportunities in Bioengineering.
- Many students work in labs.
- We encourage students to find research projects in their junior year.
Bioinformatics Major

- Bioinformatics is the use of computers and statistics to make sense out of the huge mounds of data that are accumulating from high-throughput biological and chemical experiments, such as sequencing of whole genomes, DNA microarray chips, two-hybrid experiments, and tandem mass spectrometry.

- Human Genome Project/Human Genome Browser
- Biology, statistics, and programming background
- Bioinformatics FAQ page: http://bme.soe.ucsc.edu/faq
Careers in Bioinformatics

- Excellent job prospects.

- Data wrangling: Dealing with huge quantities of data and using programming to do it.

- Service jobs: Assisting Biologists and interpreting their data.

- Graduate school – creating new programs.
The Human Genome Project and the field of bioinformatics have revolutionized what is possible in forensics, health care, science, criminal justice and other fields through the creation of the DNA database.

genie.ucsc.edu
Two Types of Academic Advising

- **Major/Department Advising**
  - BSOE Peer Advisers – current undergraduate students with training and skills to provide help with advising and schedule planning.
  - Professional Staff Advisers—full time staff who advise for all school of engineering majors. This includes advising on major-specific requirements, declaration of major process, forms and helping students determine their qualification for school of engineering majors.
  - Faculty Advising — they are available to advise on course content, career and research opportunities, choosing electives in the major.

- **College Advising**
  - College Advisers – they advise on general education, progress to degree, non-major related advising issues.
BSOE Undergraduate Advising & Student Affairs Services

- 225 Baskin Engineering Building (West End of Building)
- Monday through Friday
  - 9:00-11:30 am
    - Drop-off and/or pick-up forms
    - Ask general questions
    - Get assistance with academic plans
    - Make appointments with staff for afternoon
  - 1:30-4:00 pm
    - Drop-off and/or pick-up forms
    - Ask general questions
    - Get assistance with academic plans
    - Meet with Staff Advisers

**Advising Workshops**: Consult Schedule

**Email**: advising@soe.ucsc.edu
Important Undergraduate Advising Office Resources

- Peer Advisers
- Staff Advisers
- BSOE Undergraduate Advising website: [ua.soe.ucsc.edu](http://ua.soe.ucsc.edu)
- BSOE Undergraduate e-newsletter
- BSOE Advising Workshops
  - Major Qualifications
  - Major Declaration
  - General Academic Advising
What to take in the Fall

Sign up for 3 Courses (Math+Major+College/GE course)

1. Math
   ✓ In order to enroll into a Math course, must have completed Math placement, have AP, or college level credit.
   ✓ No Placement Exam yet? Exams completed during summer orientation will be posted by August 4th.
   ✓ Specific course will depend on math placement exam score, AP, or college level credit. Students should focus on Calculus Math 19A/B (or Math 3) **Do not take the following Math series courses: Math 11A, AMS 11A or 15A, or Econ 11A**

2. Major course
   • Specific course will depend on major, and in some cases math preparation.

3. College Core course or a General Education (GE) course
Getting Started: Bioengineering

- **Biomolecular:**
  - Math
  - Chem 1A (or BME 80G or BME 5)
  - Core or GE

- **Bioelectronics:**
  - Math
  - Physics or Programming (CMPE 8 or CMPE 12/L)
  - Core or GE

- **Assistive Technology (Motor and Cognitive/Perceptual):**
  - Math
  - Programming (CMPE 8 or CMPE 12/L)
  - Core or GE

*Recommend all concentrations take the Physics 5 series.*
Getting Started: Bioinformatics

- Fall quarter courses:
  - Math
  - Chemistry
  - Core or GE

- Start taking programming classes as soon as possible
What’s Next?

Today:
- Questions and Answers
- Enroll in Fall Classes

Summer:
- Spend some time reviewing the BSOE website [http://ua.soe.ucsc.edu](http://ua.soe.ucsc.edu)
- Brush up on math skills
- Check out UCSC Career Center website and resources
- Regularly check (or redirect) your SlugMail!

Fall:
- BSOE Fall Orientation, Tuesday, September 30, 2014
  9:00am – 12:00pm @ Media Theater
  - Department/Major Break-out Sessions with Faculty
  - BSOE Fall Welcome Event @ Engineering Courtyard
Questions??