People, Ideas, Innovation …
ENGINEERING your FUTURE

......a path to Careers in

Business

Medicine

Environmental Law

Architecture

Design

......and almost anything else!
With an engineering degree you could be a …

Teacher

Doctor

Lawyer
And even an ….

Astronaut!
Because Engineers solve problems,
We need engineers with many different backgrounds, and interests.
Without diversity, we may not recognize a problem that needs to be solved!

We need you!
WHY OSU?

Engineering classes in 1st quarter of 1st year
Get connected with your fellow classmates

Big school with a small school environment
• All the resources of an 18,000 person major university
• Close-knit community with a student/faculty ratio of 20:1

Top Tier Engineering Program
• Research Opportunities for Undergrads
College of Engineering Majors

- Bioengineering (BioE)
- Chemical Engineering (ChE)
- Environmental Engineering (EnvE)
- Civil Engineering (CE)
- Construction Engr Management (CEM)
- Electrical and Computer Engineering (ECE)
- Computer Science (CS)
- Industrial & Manufacturing Engr (IME)
- Mechanical Engineering (ME)
- Nuclear Engineering (NE)
- Radiation Health Physics (RHP)
- Forest Engineering (FE)
Construction Engineering and Management
What is it?

Construction skills + Engineering skills = Business/Management = CEM
Construction Engineers can....

- Manage sites for construction
- Build Homes
- Construct alternative routes
- Be part of fantastic designs
- Construct a stadium
Civil Engineering
“Structural Engineering is the art of designing and making buildings, bridges, frameworks, and other similar structures so that they can safely resist forces to which they may be subjected.” –Dr. Higgins

Facilities offered at OSU:

Structural Strong-Wall Facility
Industrial and Manufacturing Engineering
Information Systems
- Artificial Intelligence
- Wireless Networking
- Barcode Data Capture
- Visual Programming

Business Management
Become an entrepreneur
- Learn what it takes to create your own business
Let your Industrial engineering skills lead you to upper management
Micromanufacturing

• Develop new devices that are smaller and more efficient

Process Development

• Rapid Prototyping
  – Create 3D objects using computer based models
• Material science
• Automation
Lean Manufacturing

- Learn how industries have accommodated modern consumer needs more efficiently than ever
  - Faster shipments, fewer defects and lower costs create happy customers

Human Factors Engineering

- Study of how humans interact with machines
- Ergonomics
Mechanical Engineering
What is Mechanical Engineering?

* It is one of the broadest engineering disciplines
* Mechanical engineers research, develop, design, manufacture, and test tools, engines, machines, and other mechanical devices
Specialties within Mechanical Engineering:

* Biomechanical Engineering
* Automotive Engineering
* Aerospace Engineering
* Design and Mechanics
* Material Science
* Thermal Fluids
Nuclear Engineering
and
Radiation Health Physics
• Generation IV! The latest and greatest in reactor design.
• Clean Air Initiative

- Steam released from nuclear plant cooling tower
- Smoke released from the stack of a coal burning plant
Research at OSU

- Advanced Plant Experiment (APEX)
  OSU has gained international recognition for its pioneering work in the area of multi-phase fluid flow and heat transfer.
- Neutron Activation Analysis
  Determining the elemental composition of a particular sample
• Other careers for nuclear engineers:
  – Medical Industry
  – Propulsion
  – Nuclear Space Program
Radiation Health Physics

- Radiation Protection
- Pre-med / Medical Physics
Environmental Engineering
Environmental Engineers Control Air and Water Pollution
Environmental Engineers RemEDIATE Hazardous Substances From Contaminated Sites

Penguins Covered In Oil From A Spill
Environmental Engineers Develop Methods To Sustain The Environment
Chemical Engineering
What is Chemical Engineering?

1) A branch of engineering that focuses on chemical processes.

2) A broad profession that allows people to do many different things throughout their careers and gives them opportunities to help society by:
   • Developing new products and technologies
   • Addressing and solving environmental problems
What do chemical engineers do?
Where do they work?

• Pharmaceutical Industry
• Semiconductors
• Commodities Industry
  - Shampoo, lotion, etc.
  - Cosmetics
• Petrochemical Industry
• Manufacture of Paper Products
As you can see from the model, the structure is basically a--...long,...twisty,...uh, rope-laddery-type...thingy.

1953: The structure of the DNA molecule is first described.
What is bioengineering?

You can:

– Become a doctor
– Create new body parts/prosthetics
– Design drugs
– Clean up the environment
– Basic research all the way through full scale production

Make mathematical models of real body systems
Learn

• How bodies react to the low gravity environment of space

• How to teach seaweed to eat TNT and clean up old weapons
• How to design new kidney dialysis machines using microreactors

• How to use gel beads to cure diabetes
Electrical and Computer Engineering
What they do:

- Communications and Signal Processing
- Computer Architecture, Networks and Systems
- Control Engineering
- Electromagnetics and Electronics
- Energy Systems
- Materials and Devices
- and much more!
Computer Architecture, Networks and Systems

- Designing computers, microprocessors and hardware
- Networks and systems for transmission and storage of data
Energy Systems

• Power and energy conversion (motors, generators…)
• Renewable power
Communications and Signal Processing

- Transmission of data over wires or wireless channels
  - computer networks
  - satellite communications
  - digital audio

- TV
- Radio
- cell phones
- pagers

Future of cell phones
Energy Systems

- Power and energy conversion (motors, generators…)
- Renewable power

Water Energy

Motor

Solar Energy

Wind Power
Electromagnetics and Electronics

- Utilizes electromagnetic fields for optics, antennas, microwave systems
- Circuit design
Materials and Devices

- Semiconductor industry, nanotechnology, creating smaller and smaller components.

Resistors of various sizes

Wafer with chips processed onto it
Computer Science

College of Engineering
Computer Scientists Help Save the World...

Embedded systems in cars, airplanes, etc

Modeling and Simulations

Bioinformatics and biological science applications

College of Engineering
Saving the World One Village at a Time…
Forest Engineering

- What do we do?
- Build roads
- Build bridges
- Sustainable harvesting:
  - Awareness of wildlife habitat
  - Protection of riparian areas
- Safety
Forest Engineering

- ABET Accredited
- 1 of 4 universities in US offering an undergraduate forest engineering degree
- Access to college-owned forest
- Preparation for:
  - licensed professional land surveyor or
  - licensed professional engineer
Students

Even the cows here are smart.

College of Engineering
Students
Groups & Activities

OSU
Oregon State University

College of Engineering
College of Engineering
OSU Wins At Cal Poly in 2003!

Design Competition

College of Engineering
Oak Creek cleanup

- Restoration Project along Oak Creek

- Goal is to restore the wetland area and provide a scenic trail along creek
New Learning Platforms!

TekBots!
Society of Automotive Engineers
» Formula
» Mini Baha
  * Placed 1st and 3rd in 2004 West Competition

Human Powered Vehicle Team
  * Placed 4th overall at 2005 West Competition
  * 3rd in 40 mile endurance race
  * 5th in men’s and women’s sprint
## WHY Engineering?

<table>
<thead>
<tr>
<th>DEPARTMENT</th>
<th>USA AVERAGE SALARY 2005</th>
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<tbody>
<tr>
<td>CHEMICAL ENGINEERING</td>
<td>$53,639</td>
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<tr>
<td>COMPUTER ENGINEERING</td>
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<td>ELECTRICAL ENGINEERING</td>
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<td>BIOENGINEERING</td>
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<td>BUSINESS ADMINISTRATION</td>
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Scholarships

- College of Engineering gives over **$2.5 million** each year in Engineering Scholarships

For example:
- **Johnson Scholarship** for *High School* students
  - $11,000 over 4 yrs with a guaranteed summer internship after your first year!
MECOP/CECOP Internships

Multiple Engineering Cooperative Programs

Civil Engineering Cooperative Program

• Two 6 month internships in the NW @ 80% BS engineering salary (approx. $20/hr or $45,000)

• Get working experience before you graduate

  • Unique to Oregon State University

  • Over 70 companies
Are **YOU** ready to change the world?

Visit OSU and see the College of Engineering!
Coe.ambassadors@oregonstate.edu
Thanks for your time!