ENGR1110: Introduction to (Electrical, Computer & Wireless) Engineering

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Department of Electrical & Computer Engineering
Syllabus

- Course web site
  - check it frequently for announcements

- Objectives
  - Engineering design
  - Graphical, oral, and written technical communication
  - Software tools: Word, Excel, Powerpoint, MATLAB, SolidEdge

- Textbook
  - *Introduction to Engineering Design, Book 7: Projects, Skills and LEGO Challenges*, Dally and Reeves

Syllabus

- Grading

  Labs/Homework  25%
  Quizzes         25%
  Prelim Design Report  5%
  Final Design Report  20%
  Final Design Presentation  10%
  Competition        15%

  90 - 100   A
  80 - 89    B
  70 - 79    C
  60 - 69    D
  ≤ 59       F
Professional Development Hours

- Professional engineering licensing requires professional development hours
- Pick two of the following:
  - Student professional society meetings (IEEE, ASME, AIChE, SWE, etc.)
  - Guest lectures on campus announced in class
  - Optional ethics lecture by Dr. Reeves on 11/20
  - Other preapproved lecture/meeting
- One-page memo for each – 1st due 10/7.
- Memos due within eight days of meeting.
- Up to 3 extra-credit memos, add up to 1 pt/memo to final grade

Expectations

- Be on time, pay attention, ask questions
- Keep thorough, organized class notes
- Read the assigned material BEFORE class
- Do neat, organized work for labs, homework, and quizzes
Et Cetera (etc.)

- Attendance
  - EXTREMELY IMPORTANT
- Quizzes
  - 5 minutes at end of every lecture
  - Covers previous lecture/lab & reading
- Accessibility/Disability
- Outline/Schedule
- Office hours -- 2-3 TW

Team Application Forms

- Help me get to know you
  » pictures
- Email
- Design team assignments
Announcements

- Lab begins Friday. Meet in 356 (not 367!!).
- Get lab assignment from class website, and read it in advance. A short quiz will be given at the beginning of each lab covering the lab assignment.

What is Engineering?

- The application of science and mathematics to the design, construction and use of systems, through the process of analysis and synthesis, to solve a specific problem.

  System = a collection of interacting or interdependent components.

  Analysis = the logical or mathematical examination of the components and the characteristics of a system.

  Synthesis = the selection of components to form a system with specific characteristics.
“Big 6” Engineering Fields

- Civil ~ 1852 (ASCE)
- Mechanical ~ 1880 (ASME)
- Electrical ~ 1884 (IEEE)
- Chemical ~ 1904 (AIChE)
- Computer ~ 1947 (ACM)
- Industrial ~ 1948 (IIE)

Top Engineering Achievements

- Write down top three engineering achievements of the 20th century
## Top 20 Engineering Achievements of the 20th Century

1. Electrification
2. Automobile
3. Airplane
4. Water Supply and Distribution
5. Electronics
6. Radio and Television
7. Agricultural Mechanization
8. Computers
9. Telephone
10. Air Conditioning and Refrigeration
11. Highways
12. Spacecraft
13. Internet
14. Imaging
15. Household Appliances
16. Health Technologies
17. Petroleum and Petrochemical Technologies
18. Laser and Fiber Optics
19. Nuclear Technologies
20. High-performance Materials

### BS Degrees Awarded (‘99-'00)

<table>
<thead>
<tr>
<th>Discipline</th>
<th>BS Degrees Awarded</th>
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<tbody>
<tr>
<td>Nuclear</td>
<td>1</td>
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<tr>
<td>Mining</td>
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<tr>
<td>Petroleum</td>
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<tr>
<td>Eng. Sci &amp; Mech</td>
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<tr>
<td>Agricultural</td>
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<tr>
<td>Industrial</td>
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<tr>
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<tr>
<td>Other</td>
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<tr>
<td>Mechanical</td>
<td>12</td>
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<tr>
<td>Electrical-Comp</td>
<td>15</td>
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</table>

![Bar chart showing BS degrees awarded in various disciplines]
## Starting BS Salaries (2008)

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Annual Salary</th>
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<tbody>
<tr>
<td>Computer engineering</td>
<td>$59,962</td>
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<tr>
<td>Chemical engineering</td>
<td>$63,616</td>
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<tr>
<td>Electrical engineering</td>
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<td>Aerospace engineering</td>
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<td>Mechanical engineering</td>
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<td>Industrial engineering</td>
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<tr>
<td>Civil engineering</td>
<td>$50,940</td>
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</table>

## What is Electrical & Computer Engineering?

- Electrical Engineering is the design of electrical systems to accomplish the engineering mission.
  - Computers
  - Microelectronics
  - Communications & Digital Signal Processing
  - Power
  - Control systems
  - Electromagnetics
Electrical Engineering Applied

Apple iPhone

Engineering Teams

- Engineering requires teamwork!
- Important for college survival as well.
- Attention must be given to the functioning of the team, not just the end product.
Stages of Team Development

- Orientation
- Dissatisfaction
- Resolution
- Production
- Termination

Categories of Group Behavior

- Leading
  - initiate
  - provide
  - seek
  - clarify
  - test
  - summarize

- Supporting
  - monitor
  - encourage
  - compromise
  - sense
  - harmonize
  - test

- Hindering
  - resist
  - degrade
  - dominate
  - avoid
  - withdraw
  - distract