ME 370: The Mechanical Engineering Profession

Lecture 01: Introduction
Purpose

Prepare you for the non-technical aspects of your career
Course Learning Objectives

Upon complete of this class you should be able to

1. Develop a five-year career plan
2. Demonstrate professional standards of written communication, including email
3. Describe the cost of hiring an engineer and other operating costs associated with engineering
4. Describe the role of patents and intellectual property rights.
5. Perform a preliminary patent search at uspto.gov
Course Learning Objectives

(continued)

6. Distinguish between sustaining and disruptive innovation; distinguish between incremental and radical innovation

7. Identify the basic tenets of the ASME code of ethics

8. Demonstrate basic knowledge of ethical reasoning through the discussion of case studies.

9. Discuss the role of ethics in design decisions.
Course Learning Objectives

(continued)

10. Describe social, environmental, political and economic factors influencing development and use of technology

11. Describe how considerations of sustainability affect engineering decisions
Instructor

Gerry Recktenwald
gerry@pdx.edu
Associate Professor & Department Chair
Engineering Building, Suite 400
503-725-4290
Relationship of ME 370 to the BSME Curriculum
# Possible 4 Year Course Plan

## Math / Science Requirements

<table>
<thead>
<tr>
<th>FRESHMAN</th>
<th>SOPHOMORE</th>
<th>JUNIOR</th>
<th>SENIOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL</td>
<td>WINTER</td>
<td>SPRING</td>
<td>FALL</td>
</tr>
<tr>
<td><strong>CALCULUS</strong></td>
<td><strong>LINEAR ALG</strong></td>
<td><strong>DIF EQ I</strong></td>
<td><strong>STAT 451 CM</strong></td>
</tr>
<tr>
<td>MTH 251</td>
<td>MTH 252</td>
<td>MTH 261</td>
<td>MTH 254</td>
</tr>
<tr>
<td><strong>CHEM</strong></td>
<td><strong>PHYSICS</strong></td>
<td><strong>PH 221</strong></td>
<td><strong>PH 222</strong></td>
</tr>
<tr>
<td>CH 221</td>
<td>CH 222</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH 227</td>
<td>CH 228</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Engineering / Computer Science Requirements

<table>
<thead>
<tr>
<th>Freshmen Engineering</th>
<th>STATICS</th>
<th>DYNAMICS</th>
<th>ENGR APPLIED</th>
<th>HEAT TRANS</th>
<th><strong>CAPSTONE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 120</td>
<td>ME 121</td>
<td>ME 122</td>
<td>EAS 211</td>
<td>EAS 212</td>
<td>EAS 215</td>
</tr>
<tr>
<td><strong>ELECT</strong></td>
<td><strong>MECH</strong></td>
<td><strong>DESIGN</strong></td>
<td><strong>MEAS</strong></td>
<td><strong>ME</strong></td>
<td></td>
</tr>
<tr>
<td>ME 213</td>
<td>ME 241 &amp; 241L</td>
<td>ME 240</td>
<td>ME 320</td>
<td>ME 313</td>
<td>ME 314</td>
</tr>
<tr>
<td><strong>ME</strong></td>
<td><strong>ME</strong></td>
<td><strong>ME</strong></td>
<td><strong>ME</strong></td>
<td>Elective</td>
<td>Elective</td>
</tr>
</tbody>
</table>

## General Education Requirements

<table>
<thead>
<tr>
<th>FRESHMAN INQUIRY</th>
<th>SOPHOMORE INQUIRY</th>
<th>PRIV</th>
<th>UNST</th>
<th>TECH</th>
<th>UNST</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNST 1X1</td>
<td>UNST 1X2</td>
<td>UNST 1X3</td>
<td>UNST</td>
<td>UNST</td>
<td>UNST</td>
</tr>
<tr>
<td>UNST</td>
<td>UNST</td>
<td>UNST</td>
<td>INVEST</td>
<td>DIVISION</td>
<td>WRITING</td>
</tr>
<tr>
<td>2XX</td>
<td>2XX</td>
<td>2XX</td>
<td>EC314U</td>
<td>CLUSTER</td>
<td>WR 327</td>
</tr>
</tbody>
</table>
Upper Division
BSME Curriculum

### Math / Science Requirements

<table>
<thead>
<tr>
<th></th>
<th>FALL</th>
<th>WINTER</th>
<th>SPRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 451 CM</td>
<td>STAT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Engineering / Computer Science Requirements

<table>
<thead>
<tr>
<th></th>
<th>FALL</th>
<th>WINTER</th>
<th>SPRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR THERMO</td>
<td>APPLIED THERMO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 321</td>
<td>ME 322</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 320</td>
<td>ME 313</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 350</td>
<td>ME 351</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CAPSTONE

<table>
<thead>
<tr>
<th></th>
<th>FALL</th>
<th>WINTER</th>
<th>SPRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 491</td>
<td>ME 492</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 488</td>
<td>CONCEPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 493</td>
<td>DETAIL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### General Education Requirements

<table>
<thead>
<tr>
<th></th>
<th>FALL</th>
<th>WINTER</th>
<th>SPRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIV</td>
<td>UNST</td>
<td>TECH</td>
<td>UNST</td>
</tr>
<tr>
<td>PUBLIC</td>
<td>UPPER</td>
<td>REPORT</td>
<td>UPPER</td>
</tr>
<tr>
<td>INVEST</td>
<td>DIVISION</td>
<td>WRITING</td>
<td>DIVISION</td>
</tr>
<tr>
<td>EC314U</td>
<td>CLUSTER</td>
<td>WR 327</td>
<td>CLUSTER</td>
</tr>
</tbody>
</table>

---

**Note:**
- **SHAPED AREA = CORE ADMISSION REQUIREMENTS**
- Refer to the PSU Bulletin for General Education Requirements.

---

**Website:** [www.me.pdx.edu/programs/undergrad](http://www.me.pdx.edu/programs/undergrad)
### Upper Division BSME Curriculum

#### Junior year prerequisites

<table>
<thead>
<tr>
<th>FRESHMAN</th>
<th>SOPHOMORE</th>
<th>JUNIOR</th>
<th>SENIOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL</td>
<td>FALL</td>
<td>FALL</td>
<td>FALL</td>
</tr>
<tr>
<td>WINTER</td>
<td>WINTER</td>
<td>WINTER</td>
<td>WINTER</td>
</tr>
<tr>
<td>SPRING</td>
<td>SPRING</td>
<td>SPRING</td>
<td>SPRING</td>
</tr>
</tbody>
</table>

#### Math / Science Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 451 CM</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Engineering / Computer Science Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 120</td>
<td>4</td>
</tr>
<tr>
<td>ME 121</td>
<td>4</td>
</tr>
<tr>
<td>ME 122</td>
<td>3</td>
</tr>
</tbody>
</table>

#### General Education Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIV UNST</td>
<td>3</td>
</tr>
<tr>
<td>PUBLIC UNST</td>
<td>3</td>
</tr>
<tr>
<td>INVEST INVEST</td>
<td>3</td>
</tr>
<tr>
<td>EC314U EC314U</td>
<td>1</td>
</tr>
</tbody>
</table>

### Important Notes
- Shaded area = Core Admission Requirements
- Refer to the PSU Bulletin for General Education Requirements
### Upper Division BSME Curriculum

#### Key senior year prerequisites
### Upper Division BSME Curriculum

#### Key senior year prerequisites

**Possible 4 Year Course Plan**

<table>
<thead>
<tr>
<th>FRESHMAN</th>
<th>SOPHOMORE</th>
<th>JUNIOR</th>
<th>SENIOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL</td>
<td>WINTER</td>
<td>SPRING</td>
<td>FALL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WINTER</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SPRING</td>
</tr>
</tbody>
</table>

**Math / Science Requirements**

<table>
<thead>
<tr>
<th>Class</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALCULUS</td>
<td></td>
</tr>
<tr>
<td>LIN</td>
<td></td>
</tr>
<tr>
<td>CALD</td>
<td></td>
</tr>
<tr>
<td>IV EQ I</td>
<td></td>
</tr>
<tr>
<td>STAT</td>
<td></td>
</tr>
</tbody>
</table>

**Engineering / Computer Science Requirements**

<table>
<thead>
<tr>
<th>Class</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR THERMO</td>
<td></td>
</tr>
<tr>
<td>FLUID THERMO</td>
<td></td>
</tr>
<tr>
<td>ME 321</td>
<td></td>
</tr>
<tr>
<td>ME 322</td>
<td></td>
</tr>
<tr>
<td>ME 323</td>
<td></td>
</tr>
<tr>
<td>FLUID MECH</td>
<td></td>
</tr>
<tr>
<td>MECH ANALYS</td>
<td></td>
</tr>
<tr>
<td>ME 320</td>
<td></td>
</tr>
<tr>
<td>ME 313</td>
<td></td>
</tr>
<tr>
<td>ME 314</td>
<td></td>
</tr>
<tr>
<td>PROG ME</td>
<td></td>
</tr>
<tr>
<td>ME 350</td>
<td></td>
</tr>
<tr>
<td>ME 351</td>
<td></td>
</tr>
</tbody>
</table>

**Capstone**

<table>
<thead>
<tr>
<th>Class</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 491</td>
<td></td>
</tr>
<tr>
<td>ME 492</td>
<td></td>
</tr>
<tr>
<td>ME 493</td>
<td></td>
</tr>
</tbody>
</table>

**General Education Requirements**

<table>
<thead>
<tr>
<th>Class</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIV PUBLIC</td>
<td></td>
</tr>
<tr>
<td>INVEST</td>
<td></td>
</tr>
<tr>
<td>EC314U</td>
<td></td>
</tr>
</tbody>
</table>

---

**Notes:**

- **STAT 399-ME Statistics for ME**
- **Approved Electives**
- **Shaded Area = Core Admission Requirements**
- **Refer to the PSU Bulletin for General Education Requirements**
D2L Logistics

• Log on via http://d2l.pdx.edu
• Enter your “odin” credentials
• Select ME 370
Drop box assignments

Include this information

• Your name
• The date
• Department and course number, i.e. “ME 370”
• Short title or tag for the assignment, e.g. “HW 3: Individual Project Proposal”
Submit Files - Group HW1: Career planning

Folder
Group HW1: Career planning

Group Category
Homework groups

Group Name
Group 1

Due Date
Oct 10, 2014 11:59 PM

Submit Files

Files to submit *
(0) file(s) to submit

After uploading, you must click Submit to complete the submission.

Add a File  Record Audio

Comments

Don’t forget to click “Submit”
ME 370 Topics

Career planning
Business practices
Engineering ethics
Intellectual property
Current issues in technology and society
Sustainability
Career Planning

Upon completing this course you will be able to

• Define “professional” in the context of an engineering career
• List career paths for individuals with a BSME
• Describe your professional strengths and weaknesses
• Describe your professional interests
• Write a 5 year career plan
Values and Expectations

You are all free to chose how to act

1. We all have personal values

2. We (PSU, MME Faculty, society) cannot control what you think or choose to do
   a. We can inform you of standards
   b. We can expect to to conform to those standards as a condition of being a student
   c. We cannot force you to have certain values
Values and Expectations

In this class I expect you to demonstrate knowledge of common standards of behavior

1. What are those standards? e.g. ASME Code
2. What standards are expected of PSU students?
3. What behaviors are consistent with those standards?
4. What behaviors are personal decisions outside of those standards
Why choose engineering?

What are the necessary attributes of a good job?
What are the desirable, but not necessary aspects of a good job?
Why would you make a distinction between necessary and desirable?
What are your personal strengths?
How does engineering match your strengths?
Why worry about non-technical stuff?

The Engineer of 2020, p. 27

... Both on a macro scale, where the world’s natural resources will be stressed by population increases, to the micro scale, where engineers need to work in teams to be effective, consideration of social issues is central to engineering. Political and economic relations between nations and their peoples will impact engineering practice in the future, probably to a greater extent than now. Attention to intellectual property, project management, multilingual influences and cultural diversity, moral/religious repercussions, global/international impacts, national security, and cost-benefit constraints will continue to drive engineering practice.
Why worry about non-technical stuff?

The Engineer of 2020, p. 27

... Both on a macro scale, where the world’s natural resources will be stressed by population increases, to the micro scale, where engineers need to work in teams to be effective, consideration of social issues is central to engineering. Political and economic relations between nations and their peoples will impact engineering practice in the future, probably to a greater extent than now. Attention to intellectual property, project management, multilingual influences and cultural diversity, moral/religious repercussions, global/international impacts, national security, and cost-benefit constraints will continue to drive engineering practice.
ME 370 Progression of Ideas

Self:
career awareness & planning

Job:
• Business practices, email
• Intellectual property

Profession:
• What is a professional?
• Ethics

Society:
• Economics
• Law
• Politics
• Environment
• Sustainability
What is a professional?