Project Management
Motivation

- Projects are king in the career of engineers!
- Middle management continues to shrink
- Industry now organizes more around projects than functions.

Engineers have led the way on project management!
The Basic Idea

To complete the project

- On-time
- Within budget
- So that it meets the requirements
The Work Breakdown Structure

- A WBS displays and defines the product, or products, to be developed and/or produced. It relates the elements of work to be accomplished to each other and to the end product.
- A WBS can be expressed down to any level of interest. However the top three levels are as far as any program or contract need go unless ….
Elements of the Project Plan

- Activities
- Responsibilities
- Timeline
- Dependencies
- Costs

HINT: THESE THINGS OUGHT TO BE IN YOUR PLAN!
Example – Thermometer Design

Problem: Create the WBS for a temperature monitoring system design
Example

There are three main tasks
1. The analog interface circuitry.
2. The LED & digital circuitry.
3. Integrate & Test.
# Activities

<table>
<thead>
<tr>
<th>ID</th>
<th>Activity</th>
<th>Description</th>
<th>Deliverables / Checkpoints</th>
<th>Duration (days)</th>
<th>People</th>
<th>Resources</th>
<th>Predecessors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interface Circuitry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1.1 | Design Circuitry         | Complete the detailed design and verify it in simulation | • Circuit schematic  
• Simulation verification | 14               | Rob (1)  
Jana (1) | • PC  
• SPICE simulator |              |
| 1.2 | Purchase Components      |                                                     | • Identify parts  
• Place order  
• Receive parts | 10              | Rob         |                          | 1.1          |
| 1.3 | Construct & Test Circuits| Build and test.                                     |                            |                 |              |                          |              |
| 1.3.1| Current Driver Circuitry| Test of circuit with sensing device.                  | • Test data  
• Measurement of linearity | 2               | Jana (1)  
Rob (2) | • Test bench  
• Thermometer | 1.2          |
Ganttt Charts

- **Gantt Chart and/or Network Diagram.** Provide a graphical representation of the project plan.
Creating a Gantt Chart

• First step is defining your project plan structure. I suggest you to use this basic structure:
  – Column A: Task ID (WBS) (an unique ID which identifies each task with a progressive number).
  – Column B: Task description (a short description of the activity).
  – Column C: Percentage of completion (0%-100%).
  – Column D: Predecessor (finish-start relationships between tasks).
  – Column E: Start date (task start date).
  – Column F: Finish date (task finish date).

http://www.editgrid.com/
Or Google Gant Chart
- **Costs.** Develop a tabulated list of costs and for the equipment, materials, and labor necessary to carry out the project.
Consider Alternative Designs

- Decision Matrix

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Cost</th>
<th>Size</th>
<th>Complexity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>17</td>
</tr>
</tbody>
</table>
Homework

• Do a Gantt Chart for your project
• Describe 5 alternative designs (do the decision matrix for each case)
• Design test plans for 5 different functionalities – assign responsibilities to each test
• Finalize your web site
• Identify 5-10 risks and describe your contingency play for each
• Identify 5-10 major technical issues and describe how each can impact the design