Lab Safety Policies

- Don’t stand on lab chairs
- Don’t sit or stand on lab tables
- No dangling jewelry or loose clothes.
- NO open toed shoes.
- Be careful with sharp corners.
- Recall location of phone and first-aid kit.
- Report ALL injuries

"... and should be asked to leave."
## Overview of Labs

<table>
<thead>
<tr>
<th>Lab 1</th>
<th>Introduction to Roller Coaster Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab 2</td>
<td>Roller Coaster Energy Losses</td>
</tr>
<tr>
<td>Lab 3</td>
<td>Roller Coaster Circuits with Circuit Prototyping</td>
</tr>
<tr>
<td>Lab 4</td>
<td>Roller Coaster Speed Sensor Calibration</td>
</tr>
<tr>
<td>Lab 5</td>
<td>RC Building Session #1</td>
</tr>
<tr>
<td>Lab 6</td>
<td>RC Building Session #2</td>
</tr>
<tr>
<td>Lab 7</td>
<td>RC Building Session #3</td>
</tr>
<tr>
<td>Lab 8</td>
<td>RC Final Construction - Preliminary Testing of Design</td>
</tr>
<tr>
<td>Lab 9</td>
<td>RC Final Testing of Design</td>
</tr>
<tr>
<td>Lab 10</td>
<td>RC Oral Presentations</td>
</tr>
</tbody>
</table>
Engineering 1182.01
Roller Coaster
Building Session #2
Oral Presentations

• **Purpose** - Sell your ideas quickly and concisely; captivate your audience

• **Focus of Presentation**: Final Design, Performance Analysis & Conclusions
  • Do NOT discuss the roller coaster specifications since they were given and are the same for every group!

• **Length of Presentation**: 8 minutes for presentation, plan accordingly!

• Must use PowerPoint!

• Answer any questions
Content

• ‘Content’ is more than just the words
Preparation

• PLAN YOUR TALK
• Tell the audience your plan
• Tell the audience when you’re switching topics
• PRACTICE YOUR TALK
• Make smooth transitions between speakers
• Stay within the time limit - comfortably
First-Year Engineering Program

Preparation

• Focus on Broad Issues
  • Major Ideas
  • Major Supporting Information

• “Take Home” Message
  • The thing you want them to remember
  • Repeat this message more than once

• Conclusion
  • Strong ending
  • Thank the audience and ask if there are any questions
  • Before answering a question, repeat it

P. 7
Text

• Make it BIG! And **BOLD!** If necessary
• Key words or Phrases – not sentences
  • Think ‘newspaper headline’
    • E.g., “Rate faster than expected”
• Check Spelling
• **Emphasize Important points**
• Use Color
• Avoid Notes or Extra Scribbles
<table>
<thead>
<tr>
<th>Message</th>
<th>Font Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal: Audience to understand what you have done</td>
<td>9</td>
</tr>
<tr>
<td>Goal: Audience to understand what you have done!!</td>
<td>12</td>
</tr>
<tr>
<td>Goal: Audience to understand what you have done!!</td>
<td>18</td>
</tr>
<tr>
<td>Goal: Audience to understand what you have done!!</td>
<td>24</td>
</tr>
<tr>
<td>Goal: Audience to understand what you have done!!</td>
<td>32</td>
</tr>
</tbody>
</table>
Visual Aids

• Always use with a clear purpose
  • Space-fillers aren’t visual aids

• Types of Aids
  • Graphs ✓ Tables
  • Movies ✓ Pictures

• Aids should enhance your message, not distract from it
Visual Aids - Graphs

• One Graph Per Slide
• Label Axes and Data
• Use Color
• BIG LABELS!
• BIG POINTS or SYMBOLS!
• No unnecessary numbers
Which graph is better?
Visual Aids - Tables

- Use numeric data tables sparingly
- Only Necessary Numbers
  - Display proper precision!
- No Copies from Papers
  - Retype data
- If you don’t want them to ask about that data point, don’t list it!
Which table is more clear?

**Reaction Rate Comparison**

<table>
<thead>
<tr>
<th></th>
<th>Low Temp. (350 K)</th>
<th>High Temp. (600 K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Conc. (0.3)</td>
<td>Slowest (1.2)</td>
<td>Mid (1.7)</td>
</tr>
<tr>
<td>High Conc. (0.6)</td>
<td>Mid (1.8)</td>
<td>Fastest (2.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Run Number</th>
<th>Temperature (K)</th>
<th>Concentration (M)</th>
<th>Reaction Rate (mol/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>348.2</td>
<td>0.592</td>
<td>1.832</td>
</tr>
<tr>
<td>2</td>
<td>605.5</td>
<td>0.601</td>
<td>2.814</td>
</tr>
<tr>
<td>3</td>
<td>599.8</td>
<td>0.343</td>
<td>1.655</td>
</tr>
<tr>
<td>4</td>
<td>350.0</td>
<td>0.251</td>
<td>1.166</td>
</tr>
</tbody>
</table>
Slide Design Considerations

• High contrast between text color & background color
  • High Contrast
  • Low Contrast
  • What looks OK on a monitor is often not OK when projected
• Clipart can help illustrate meaning
• Text Animations
  • Use sparingly - distracting
Delivery

• Elaborate on the points the slide is providing
  • Face your audience, not your slides!
  • Face your audience, not your slides!
  • Face your audience, not your slides!

• Estimate ~1 minute per slide
  • Face your audience, not your slides!
Delivery – Body movements

• Distractions
  • Shifting, Moving without Purpose
  • Locking Hands, Hands in Pockets
  • Holding Objects

• Solution
  • Balanced Stance
  • Hands to Sides, Gesture When Appropriate
Delivery - Voice

- Voice Problems
  - Too Soft
  - Monotone
  - Too Fast
  - Um’s, Uh’s

- Negative Effects
  - Difficult to Hear
  - What’s Important?
  - Frustrating to Follow

- Solutions:
  ✓ Speak Clearly and Loudly
  - Use Inflection
  - Pause Frequently
  - Use Silence
Delivery - Eyes

- Eye Problems
  - Continuous Scanning
  - Staring into Space

- Negative Effects
  - Causes nervousness
  - No Individual Recipients
  - Accelerated Pace

- Solution
  - Lock Eyes
  - Hold for Thought
  - Move Around Room
Handling Questions

1. Ask for Question
2. Select Questioner
3. Listen to Entire Question
   - Can you hear it?
   - Look at questioner
   - Focus question
4. Break Visually from Questioner to entire audience
5. Restate / Rephrase Question
6. Answer Concisely
Today’s Assignments

• **Due next Lab**
  • Outline of Oral Presentation in written form