WHAT'S THE DIFFERENCE?
## GRADING MATRIX

<table>
<thead>
<tr>
<th>INDIVIDUAL</th>
<th>DESIGN PROCESS</th>
<th>DESIGN PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Logbook Usage</strong></td>
<td></td>
<td><strong>Team Member Citizenship</strong>&lt;br&gt;→ effort/contribution</td>
</tr>
<tr>
<td>Team Member Citizenship&lt;br&gt;→ member coaching</td>
<td></td>
<td><strong>Individual Design/Portfolio Assignments</strong></td>
</tr>
<tr>
<td>One to one interactions/observations&lt;br&gt; (includes mentors, faculty, staff)</td>
<td></td>
<td>One to one interactions/observations&lt;br&gt; (includes mentors, faculty, staff)</td>
</tr>
<tr>
<td>TEAM</td>
<td><strong>Team Member Citizenship</strong>&lt;br&gt;→ overall team dynamics</td>
<td><strong>Hardware/Software Created</strong></td>
</tr>
<tr>
<td>Client Relations/Communications</td>
<td></td>
<td><strong>Snapshot &amp; Expo Displays/Posters</strong></td>
</tr>
<tr>
<td>Design Reviews</td>
<td></td>
<td><strong>Wiki Page on Project</strong></td>
</tr>
<tr>
<td>Instructor/Team Meeting Impressions</td>
<td></td>
<td><strong>Overall Portfolio/Design Report</strong></td>
</tr>
<tr>
<td>Financial Management/Budget</td>
<td></td>
<td><strong>Client Acceptance/Enthusiasm</strong></td>
</tr>
</tbody>
</table>
ENGINEERING LOGBOOKS

Definition
An engineering logbook is a personal/professional reference about project learning and results. To protect intellectual property in the workplace, it should be bound so that pages cannot be inserted/removed, written in ink, dated, and fill consecutive pages.

Rationale
High performing individuals in all professions are similar to the extent that they monitor and control where they invest their time, they learn and apply the best practices their profession, and they regularly take time to learn from their successes and failures.

General Expectations
• 5-6 pages of thoughtful entries per week in support of a quality design process
• log of planning, communications, team meetings, and lecture notes (~20% of entries)
• project learning and product development (~70% of entries)
• review of individual/team/product performance (~10% of entries)
• organization/format for easy re-reading/re-use (self, team, mentor, instructor)
**LOGBOOK SELF-REVIEW FORM**

**STEP 1:** Review your previous logbook entries. Inventory your six best and rate each one using the rubric given to the right.

<table>
<thead>
<tr>
<th>Entry</th>
<th>Date</th>
<th>Rating (circle one)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 2 3 4</td>
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<td>1 2 3 4</td>
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</tbody>
</table>

**STEP 2:** Self-assess your logbook in the areas below using the scales provided *(circle one).*

**Project Management**

<table>
<thead>
<tr>
<th></th>
<th>1 – missing</th>
<th>2 – vague</th>
<th>3 – multiple/divergent</th>
<th>4 – focused &amp; strategic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals</td>
<td>1 – missing</td>
<td>2 – vague</td>
<td>3 – multiple/divergent</td>
<td>4 – focused &amp; strategic</td>
</tr>
<tr>
<td>Action Items</td>
<td>1 – missing</td>
<td>2 – minimal</td>
<td>3 – clear &amp; sequenced</td>
<td>4 – tasks remove bottlenecks</td>
</tr>
<tr>
<td>Team/Client Notes</td>
<td>1 – missing</td>
<td>2 – minimal</td>
<td>3 – moderate</td>
<td>4 – extensive</td>
</tr>
</tbody>
</table>
### Senior Design Logbook Evaluation Form

<table>
<thead>
<tr>
<th>Logbook Mechanics</th>
<th>Assessment</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Assessment (SII)</td>
<td>Complete</td>
<td>Dates</td>
</tr>
<tr>
<td>Self-Assessment (Most creative, etc.)</td>
<td>Complete</td>
<td>Blank Areas Lined Out</td>
</tr>
<tr>
<td>Ink</td>
<td>Complete</td>
<td>Correct Logbook Binding</td>
</tr>
<tr>
<td>Entries Titled</td>
<td>Complete</td>
<td>Complete</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Logbook Entry Assessment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Management</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Quality</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
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<tr>
<td>Frequency</td>
<td>☐</td>
<td>☐</td>
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<td>☑</td>
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</table>

<table>
<thead>
<tr>
<th>Design Development</th>
<th>1</th>
<th>2</th>
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<tbody>
<tr>
<td>Quality</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Frequency</td>
<td>☐</td>
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</table>
POTENTIAL ENTRIES

• What was the greatest value added by the projects fair beyond the online descriptions?
• Did you experience anything unexpected?
• Was there a benefit to listening to the questions/answers of others?
• What did you learn about yourself from this process?
What and why?

PORTFOLIOS

• A team portfolio is a living record of the team's progress.
• A well built portfolio will save time in creating reports, presentations, and wikipages.
• A high quality portfolio is useful for the client and future design teams in addition to the current design team.
CONTENTS OF A PORTFOLIO
Meeting Minutes

- Weekly action items
- Summary of progress
- Meeting review: Helpful/Not
- Attendance and participation
- Team member contributions
Project Learning

- What off-the-shelf technologies you can use to solve the problem?
- Why did you think the design would work?
- Why the design did not work.
- What needed to be changed?
Design Goals

- Client need and project goal (with timeline).
- Revision of goal. Why the revision was necessary?
- New goal
Specifications and constraints

• Documentation of client interview – notes, pictures, measurements, etc.
• Design specifications and constraints.
• Make notes on the reason(s) behind any constraints given by client.
System Diagrams

- Use standard symbols.
- Properly label and reference.
- May use software (such as Visio, lucid chart, AutoCAD™, SolidWorks™) or freehand.
- Document who drew and what software was used.
Analysis of Alternatives

• Discussion on possible alternatives and why some alternatives are better than other.
  • Safety
  • Less moving parts
  • Lower cost
  • Durability
  • Compatibility
  • Foolproof
Engineering Modeling

• Physical, Chemical and Biological system modeling.

• Modeling criteria, expected accuracy, pitfalls.

• Which modeling software was used?

• What data was needed, how the data was obtained.

• Validation scheme for the model.
Manufacturing/Implementation Plan

- Fabrication need.
- Flowchart for process oriented projects.
- Bill of materials, drawings.
- Manufacturer and delivery time.
Experimental Design

• Characterize the purpose of the experiment.
  • Model validation?
  • Data gap?
  • Performance measurement?

• Detailed documentation on instrumentation and measurements.
Data Analysis

- Document statistical tools used.
- Document accuracy of data, and experiment.
- Write about the confidence in your results.
- What conclusions can be made?
Balance Sheet/Budget

• Initial Budget
• Estimated cost for Materials/components/labor
• Spending plan
Appendices

• File management / archiving
• Unabridged documents
• Data sheets
• Document any issues
• Report any accidents / near misses / precautions
Capstone Portfolio Review Form

Team:

Date:

Scoring:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>NA</th>
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Problem Definition
(includes problem statement, product requirements, specifications, expected deliverables)

Project Learning
(includes literature review, engineering analysis, experiments, software learning, training)

Project Management
(includes meeting minutes, client communications, schedule, budget)