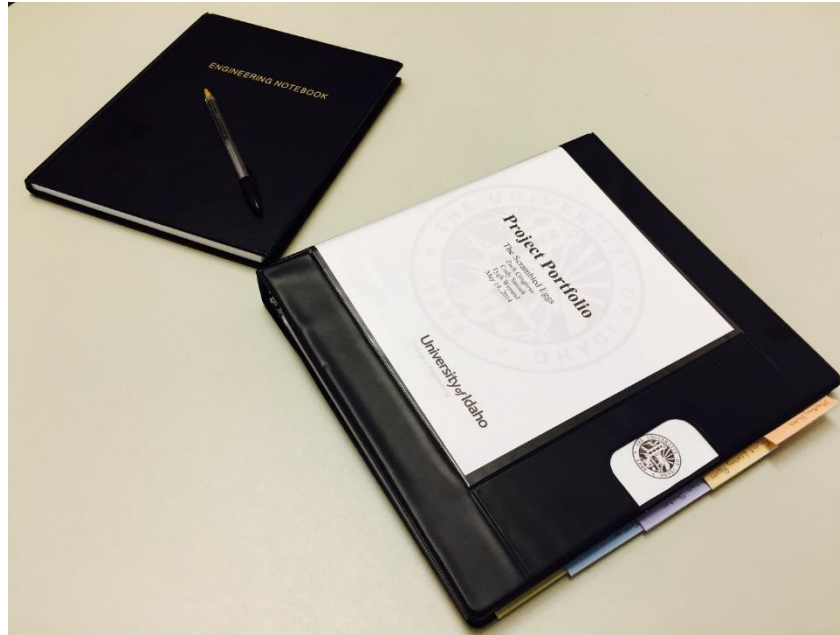


# CAPSTONE DOCUMENTATION

Logbooks and Portfolios

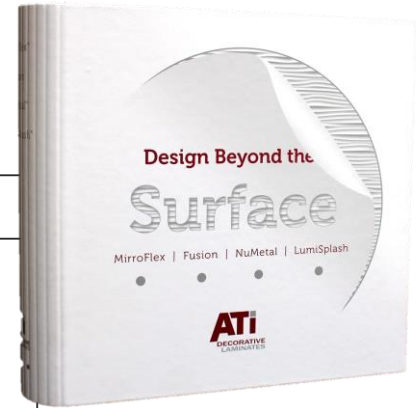
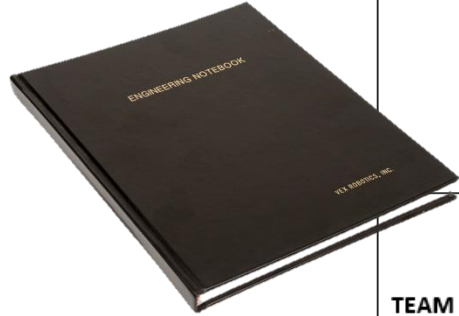


# WHAT'S THE DIFFERENCE?



# GRADING MATRIX

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



# LOGBOOKS

## 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)



# SELF-REVIEW/ASSESSMENT FORM

## 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.

- 1 – Missing
- 2 – Incomplete, minimal long-term value to author
- 3 – Complete, clear long-term value to author
- 4 – Exemplary, considerable long-term value to others

Entry	Date	Rating (circle one)
		1 2 3 4
		1 2 3 4
		1 2 3 4
		1 2 3 4
		1 2 3 4
		1 2 3 4

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

### Project Management

- |                          |             |             |                        |                              |
|--------------------------|-------------|-------------|------------------------|------------------------------|
| <b>Goals</b>             | 1 – missing | 2 – vague   | 3 – multiple/divergent | 4 – focused & strategic      |
| <b>Action Items</b>      | 1 – missing | 2 – minimal | 3 – clear & sequenced  | 4 – tasks remove bottlenecks |
| <b>Team/Client Notes</b> | 1 – missing | 2 – minimal | 3 – moderate           | 4 – extensive                |



# EVALUATION

## Senior Design Logbook Evaluation Form

Student Name	
Team Name	

Logbook Mechanics			
	Assessment		Assessment
Self-Assessment (SII)	Complete	Dates	Complete
Self-Assessment (Most creative, etc.)	Complete	Blank Areas Lined Out	Complete
Ink	Complete	Correct Logbook Binding	Complete
Entries Titled	Complete		

Logbook Entry Assessment	1	2	3	4
<b>Project Management</b>				
Quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Frequency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
<b>Design Development</b>				
Quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Frequency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
<b>Assessment</b>				



# 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



**Vandal  
Project**





## Meeting Minutes

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

Meeting  
Minutes



## 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?

Project  
Learning





## Design Goals

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

Design  
Goals



## Specifications and constraints

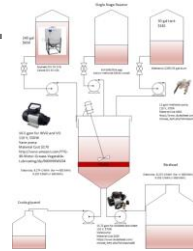
- Documentation of client interview – notes, pictures, measurements, etc.
- Design specifications and constraints.
- Make notes on the reason(s) behind any constraints given by client.

Design  
Specs.



## 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.



System Diagrams



## Analysis of Alternatives

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

Alternative  
Analysis



## 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.

Modeling







## Manufacturing/Implementation Plan

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

Mfg. Plan



## Experimental Design

- Characterize the purpose of the experiment.
  - Model validation?
  - Data gap?
  - Performance measurement?
- Detailed documentation on instrumentation and measurements.

Exp.  
Design





## Data Analysis

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

Data  
Analysis

## Balance Sheet/Budget

- Initial Budget
- Estimated cost for Materials/components/labor
- Spending plan



Budget





## Appendices

- File management /archiving
- Unabridged documents
- Data sheets
- Document any issues
- Report any accidents / near misses / precautions

Appendix  
A

# ASSESSMENT FORM

## Capstone Portfolio Review Form

**Team:**

**Date:**

**Scoring:**

1  
Missing/lacking

2

3  
Satisfactory

4

5  
Exemplary

NA  
not applicable

**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)

\_\_\_\_\_

