

Praxis I Course Outline

This document should be understood in conjunction with the Praxis I Syllabus. This document explains assignments and schedules, whereas the Syllabus outlines policies and expectations.

Note that the specific items and dates listed in this Outline are tentative and may change.

Praxis I is divided into two phases. In Phase I, students identify, evaluate, and make informed engineering design decisions. This phase uses consumer products as its context. Specifically, students will dissect electric consumer products, learn to use library resources for researching design, and develop reasoned understanding of what goes into design decisions.

In Phase II students practice high speed, iterative, engineering design to develop a proposed design for a product. This phase involves designing and prototyping a physical product for a campus service provider. In teams, students will frame the design opportunity as a design brief, use an iterative design process to develop potential concept designs including prototypes, and defend and document their design work.

1. Deliverables and Distribution of Grades

Due Date	Deliverable	Weight	Submitter
Phase I			
2016-10-03 @ 0900	Midterm Exam	10%	Individual
Phase II			
Studio week of 2016-10-10	Opportunity Pitch	5%	Individual
2016-10-30 @ 1800	Design Brief	10%	Team
Studio week of 2016-11-07 <i>A copy of the presentation must be submitted 24 hours prior to Studio</i>	Design Alpha Release • Presentation • Prototype(s) • Interaction	5%	Team
Studio week of 2016-11-28	Design Critique • Prototype(s) • Interaction	10%	Team
2016-12-04 @ 1800	Design Recommendation	15%	Team
2016-12-06 @ 1300	Design Assessment	5%	Individual
Ongoing and Summative			
2016-09-17 @ 1200	Personal Baseline	2%	Individual
<i>As specified on an individual basis throughout the term</i>	Learning Community Contributions • Lecture Extension (3%) • DfX Walkabout (3%) • Personal Design Decision (6%)	12%	Individual
2016-12-09 (to be confirmed)	Final Exam	26%	Individual

1.1. Personal Baseline

The personal baseline is an online survey that you **must** fill out in order to be assigned to a team in Phase II of the course. Note that the survey results will be used algorithmically to form teams in both Praxis I and Praxis II.

1.2. Learning Community Contributions

The learning community contributions comprise three short reports that focus on specific aspects of your learning and developing engineering design identity. The three components of the learning community contributions are:

1. Lecture Extension — a deeper explanation of some topic covered in a lecture
2. Design for X (DfX) Walkabout — an analysis of one aspect of a designed thing
3. Personal Design Decision — a careful explanation of a single design decision at the personal level that applies a design mentality

Each student will submit Learning Community Contributions at individually specified due dates. For the Lecture Extension, students should work with lecture topics for that week.

1.3. Midterm Exam (Individual)

The Midterm Exam assesses students on their ability to apply the material from Phase I. It builds directly on the Studio activities from weeks 01, 02, and 03, and is a written exam that takes place under close supervision. Students will be permitted to bring supporting evidence¹ with them to the Midterm Exam.

1.4. Opportunity Pitch (Individual)

The Opportunity Pitch² is a short, oral presentation given by each student to their Studio. It is a “pitch” in that it presents information with the explicit purpose of generating interest. It focuses on an “opportunity that would benefit from the application of engineering design” that the student has identified. The Opportunity Pitches should help to frame the Design Briefs.

1.5. Design Brief (Team)

The Design Brief is a concise written document that describes an opportunity framed in engineering design terms. Each team will produce one Brief, which may be based on one or more of their Opportunity Pitches or may frame an entirely new opportunity. The Design Brief will inform the activities leading to the Design Alpha Release, Design Critique, and Design Recommendation.

1.6. Design Alpha Release (Team)

The Design Alpha Release is the first attempt at a proposed design in response to a Design Brief. The Alpha Release consists of both a formal presentation with slides and one or more prototype(s) of the proposed design.

1.7. Design Critique (Team)

During the Design Critique each team will defend their proposed design. The team will provide drawings, prototypes, calculations, and whatever other resources will help to explain or clarify the design. This design is expected to have evolved significantly since the Alpha Release. Unlike the Alpha Release, the Critique requires no formal presentation. Instead teams will interact with their assessors in a more *ad hoc* “Question and Answer” format.

¹ Requirements for the supporting evidence (i.e. what is allowed; what is prohibited) will be explained in lecture prior to the Midterm.

² Often, engineers are called “problem-solvers.” However, this term suggests that engineers respond to negative, existing situations. The term “opportunity” emphasizes that engineers may instead “create that which has never been” or enhance what is already good.

1.8. Design Recommendation (Team)

The Design Recommendation fully documents the proposed design developed in response to the team's Design Brief. The Recommendation is a written document that can be sent to the key stakeholder recommending the design or next steps in addressing the opportunity. The team's understanding of the opportunity documented in the Design Brief is likely to have evolved significantly during development. As such the Recommendation will likely include content that enhances or supersedes that documented in the Brief.

1.9. Design Assessment (Individual)

The Design Assessment is a short written report that brings together the team's final design with the individual's values (explored explicitly in Studio 06). In the Assessment, each student will evaluate their team's design and its design process with respect to their personal values. The goal is to see how well their team's design work represents what they personally find important and meaningful in engineering design.

1.10. Final Exam (Individual)

The Final Exam assesses students as aspiring engineering designers. The Final Exam is a written exam that takes place under close supervision. During the exam students will be permitted to access selected resources as announced in lecture before the exam sitting.

2. Studio Schedule

Studios bridge the material presented and discussed in lecture with the course deliverables. Each studio has specific learning objectives and consists of targeted activities that develop skills which contribute to upcoming deliverables.

Week Starting	No.	Core Studio Activities
2016-09-12	01	Device Teardown I – Learning to See and Critique
2016-09-19	02	Library Research – Finding and Critiquing Curated Sources
2016-09-26	03	Device Teardown II – Moving from Seeing and Critiquing to Improving
2016-10-03	04	Praxis “Walkabout”
2016-10-10	05	Opportunity Pitches
2016-10-17	06	Exploring Individual and Team Identity
2016-10-24	07	Brief Charette and Zen Prototyping
2016-10-31	08	Engineering Design Iteration I – Emphasis on Diverging and Converging
2016-11-07	09	Design Proposal Alpha Presentations
2016-11-14	10	Engineering Design Iteration II – Emphasis on the Fractal Nature of Design
2016-11-21	11	Engineering Design Iteration III – Emphasis on Comprehensive Representations
2016-11-28	12	Design Critiques
2016-12-05	13	<i>No Studios this week</i>

In weeks 07, 08, 10, and 11, each team is expected to complete a **full** iteration of a simplified engineering design process. **This will involve team work both in and outside of studio.** Because of this pace students and teams must carefully manage, and integrate, both their activities and deliverables. They must also be careful to consciously and deliberately improve their facility with the skills associated with each process step.