Praxis I Syllabus

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

1. Course Overview

As the first course in the Praxis Design Sequence, Praxis I lays the foundation for future design courses in Engineering Science. This foundation includes common terminology, models and processes, necessary skills, and most importantly the Praxis Approach to Engineering Design. Key features and expectations of this approach include:

- Synthesizing multiple conceptions of “engineering” and “design” to develop an individualized understanding of, and approach to the practice of “engineering design”;
- Exploring, questioning, and developing alternative perspectives on the theory and practice of "engineering design”;
- Defending design decisions through clear engineering arguments that use multiple modes of representation;
- Developing an explicit, individual identity as an engineer and engineering designer; and,
- Demonstrating integrity between engineering design as understood and as practiced.

The Praxis Approach has as core theoretical underpinnings the Perry Model of Intellectual and Ethical Development and the Kolb Learning Cycle. Students are encouraged to explore these models to better understand the philosophy of the Praxis sequence and how to succeed in the Praxis courses.

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. In Phase II students practice high speed, iterative, engineering design and develop a proposed design for a product that their team has identified as helpful for a campus service provider. For additional details, please read the Praxis I Course Outline.

2. Teaching Team

The Teaching Team in Praxis I integrates members from the Division of Engineering Science and the Engineering Communication Program (ECP). Lectures will be given primarily by the Course Instructors, while teams of Studio Instructors and Teaching Assistants will facilitate the studios.

Course Instructors

Jason Foster (Course Coordinator)
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Robert Irish
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Professional Language Resource Person

Penny Kinnear
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Studio Instructors

Paul Barrett
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Teaching Assistants

Michael Bazzocchi (1T3 Ψ Aerospace)
michael.bazzocchi@mail.utoronto.ca
Office hours with members of the Teaching Team are by appointment on a “first-contact, first-scheduled” basis. Although the teaching team tries to be available and accessible, appointments should be scheduled at least one business day prior to the desired time. The Teaching Team may also hold in person or online support sessions. These sessions are usually scheduled to support upcoming course deliverables.

3. Resources

3.1. Hardcopy Resources


This textbook focuses on developing strong arguments and structuring them into key engineering report types (such as design reports, recommendations, etc.). As such, you should find it useful not only for Praxis, but for all of your writing in school and beyond.

3.2. Electronic Resources

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<tr>
<th>Blackboard:</th>
<th>available through <a href="https://portal.utoronto.ca">https://portal.utoronto.ca</a></th>
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<tr>
<td>Course Downloads:</td>
<td><a href="https://design.engsci.utoronto.ca/courses/esc101/20159/">https://design.engsci.utoronto.ca/courses/esc101/20159/</a></td>
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<td>Teamwork Support:</td>
<td><a href="https://teamlearning.ilead.utoronto.ca/tels">https://teamlearning.ilead.utoronto.ca/tels</a></td>
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4. Activities

4.1. Lectures

(Monday 1400-1500 • Tuesday 1300-1400 • Friday 1300-1400)

Lectures introduce the concepts required to successfully complete the course, examples of how those concepts can be and have been applied, and connections among materials from both within and outside of Praxis I.

4.2. Design Studios

(“Tutorial”; 2 scheduled hours per week)

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. Students work both individually and in teams to have experiences and meet learning objectives specific to the Studio. Thus, active participation in Studio is essential to success in Praxis.

4.3. Peer Assisted Study Sessions
(Thursday 1800-2000)

Peer Assisted Study Sessions (PASS sessions) are weekly gatherings that focus on supporting individual students in Praxis I. Each PASS session is led by PASS Leaders who were successful in previous iterations of the course. Activities during the PASS sessions will target individual skills that support success in Praxis I, such as locating and critically assessing sources, choosing among alternatives, low fidelity prototyping, etc. The PASS session will also support individual students in developing relational, organizational, and communication skills that support successful teamwork.

5. Workload

Students are expected to spend on average one hour outside of class for every one hour of classroom time (i.e. 5 hours per week per student). This workload may not be distributed evenly across the term.

Students who find themselves investing an inordinate amount of time or effort in a Praxis assignment should contact the Teaching Team immediately to explore different approaches that may increase both their efficiency and effectiveness.

6. Teams

6.1. Team Formation

In Praxis I all students must work in teams. Student teams will be formed algorithmically with the objective of creating diverse teams that provide rich learning environments. Team formation takes as input the class’s Personal Baselines, Teaching Team observations from studios, and other relevant information.

6.2. Team Grades

When working in teams, students are expected to divide workload equitably. The nature of the division is up to the team members, and does not require that all members work the same hours or produce identical volumes of work. By default, all team members receive an identical grade on team assignments.

Students should report any difficulties in their teams to a member of the Teaching Team as early as possible so that the difficulties can be addressed in a positive way. Students should also maintain as complete a record of team interactions as possible. Based on solicited, confidential feedback, the Course Instructors may adjust the grade distribution within a team.

7. Graduate Attributes and Learning Objectives

By graduation, every engineering student must demonstrate their development across twelve graduate attributes. Students who successfully complete Praxis I will demonstrate having achieved a first level (further levels will be expected in later years) in the following graduate attributes:

<table>
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<tr>
<th>Graduate Attribute</th>
<th>Learning Outcome</th>
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1. This includes, but is not limited to, meeting minutes, copies of emails, text messages, chat logs, phone calls, etc.

More specifically, having completed Praxis I, all students are expected to be able to:

1. **Develop a personal theory of engineering design that is consistent with their engineering identity and the expectations of the Engineering profession**
   a. Locate and explore accepted definitions of, approaches to, and theories of “engineering design”;
   b. Reflect on their values and those of the engineering profession to develop an engineering identity;
   c. Synthesize experience, exploration, and research into a personal theory of engineering design; and,
   d. Refine their personal theory of engineering design by reflecting on their engineering design practice.

2. **Practice engineering design, as an individual and as part of a team, with integrity between your actions and your theory**
   a. Critique existing engineering designs from the perspective of design decisions and consequences;
   b. Characterize problems and appropriately frame them as engineering problems;
   c. Structure and analyze a team design activity using a variety of formal models;
   d. Use multiple, formal methods to generate design alternatives and select among candidate designs;
   e. Transition a design between different scales and types of refinement; and,
   f. Reflect upon and learn from both their and other’s successful and failed designs.

3. **Represent and express engineering designs and ideas**
   a. Select appropriate modes of communication (oral, written, graphical) to express ideas to an audience;
   b. Structure information to credibly communicate engineering knowledge; and,
   c. Support design ideas with research, analysis, and prior design.
4. Make engineering arguments
   a. Analyze an audience and adapt modes of argument accordingly;
   b. Make appropriate claims from evidence, recognizing possible weaknesses or bias in evidence; and,
   c. Frame an argument in a manner accepted by the engineering community.

8. Grading Policies

8.1. Grade Expectations
Obtaining an “A” grade in Praxis requires demonstrating strong evidence of original thinking. Students who submit work that delivers no more than what is required, regardless of the depth to which those requirements are satisfied, are in essence showing only “evidence of grasp of subject matter”. Accordingly they can expect a maximum grade of a “B”.

**Obtaining an “A” requires that students demonstrate that they have explored aspects of the material and assignment that were not explicitly required, but that are relevant to the objectives of the assignment and the course.**

Note that an “A” grade will not be awarded to a submission where the required elements are either missing or accomplished at an unsatisfactory level, regardless of whether additional work or original thought has been demonstrated.

8.2. Grade Discussions
Students are encouraged to discuss their work, both before and after it has been graded, with their Studio Instructors and Course Instructors. **In any conversation involving grades, students must be prepared to present a cogent argument supported by evidence.** Should an assignment be regraded, the new grade may be lower, the same, or higher than the initial grade.

8.3. Late Penalties
Due dates have been selected to spread course workload over the term and to provide sufficient time for meaningful feedback. Assignments that are submitted late may be subject to a penalty. Note that this practice deviates from the more common industry practice of not accepting late deliverables.

8.4. Individual Mastery
Students in Praxis I must demonstrate individual mastery of the course materials to be ready to proceed into the more team-oriented work of Praxis II. **Accordingly students must earn an aggregate grade of ≥60% on their individual assignments to receive credit for their team contributions.** Students who earn an aggregate individual grade of <60% will receive no higher than their individual grade as their overall course grade.

Part of the required mastery includes the Engineering Faculty’s English Proficiency Requirement:

The Faculty requires each student to show an ability to write English coherently and correctly in all written work submitted for evaluation. ... Every student will [ ] take at least one course that includes a written communication component within their curriculum. Satisfactory completion of the course or courses is required for graduation. *(Calendar, FASE, 2016-2017, Academic Regulations VI.3.)*

In Engineering Science, Praxis I serves as that course. Successful completion of the written and oral components of Praxis I is considered sufficient to demonstrate such proficiency.
9. Other Policies

Engineering Science Students are expected to act professionally and to exercise common sense\(^3\). They are also expected to be familiar with, and act according to, University policies, guidelines, and interpretations. Of particular importance are those mentioned in the “Academic Regulation” section of the Faculty of Applied Science and Engineering Academic Calendar.

9.1. Support and Accommodation

Students with diverse learning styles and needs are welcome in this course. Students who have a disability or health consideration that may require accommodations are both encouraged and welcome to approach the Course Instructors as soon as possible. **Should accommodations be necessary, by University of Toronto policy students are required to contact the Accessibility Services Office.**

9.2. Illness

While the Teaching Team will work with students to ensure that they are not disadvantaged should they become ill, **students have a responsibility to work in good faith with the Teaching Team to make appropriate accommodations.** Students who become ill and are unable to complete their Praxis and Design assignment(s), or whose performance is compromised, have the option of petitioning their circumstances by following the information available in the Academic Calendar or online at: 

http://www.undergrad.engineering.utoronto.ca/Office_of_the_Registrar/Petitions.htm

Note that should you choose to pursue this path, you will need to acquire appropriate medical documentation **at the time of your illness**; documentation acquired after the fact will not be accepted.

Because much of the student work in Praxis takes place within teams, students should be careful to make arrangements with their teammates in order to mitigate the effects of a potential absence. The Teaching Team will work with student teams to help them make these arrangements.

9.3. Instructional Materials and Copyright

Students are prohibited from recording or otherwise reproducing any copyrighted materials associated with this course unless they obtain prior permission from the copyright holder. Note that all lectures are copyright of the lecturers.

9.4. Plagiarism

The University of Toronto regards plagiarism as a violation of the Code of Behaviour on Academic Matters. Plagiarism is a serious form of cheating in which a student makes use of someone else’s ideas or words without giving appropriate attribution. In your academic work, plagiarism usually occurs in one of three ways:

- You cut and paste someone else’s words or code or figure but do not clearly show what the source is for that material.
- You hand in work done by others (e.g. teammates) without putting their names on the work.
- You rephrase someone else’s idea into your own words, but do not give credit to the source of the idea.

The University takes cheating very seriously. Penalties can include zero on the assignment, zero in the course, annotations on your transcript (which would be seen by a potential graduate school or employer), or

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\(^3\) Students are encouraged to consult with the Teaching Team if they are uncertain whether an activity or decision would be unprofessional or would indicate a lack of common sense.
in extreme cases expulsion from the University. **Discuss any concerns about sources with your Studio Instructor or a Course Instructor before submitting a document for assessment.**

9.5. **Turnitin**

Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site. The intellectual property of all students submitting to Turnitin.com is protected by the licensing agreement between the University of Toronto and iParadigms. This agreement further ensures that student papers submitted to Turnitin.com will not be used for commercial purposes.

9.6. **Public Disclosure and Research**

Students agree that by taking this course their contributions (course deliverables, feedback, etc.) may be used for teaching and learning purposes, in this or subsequent courses, or to support research into improving engineering education. Any such use will conform to the Tri-Council Policy Statement: *Ethical Conduct for Research Involving Humans*. **Students who are concerned about the intellectual property or ethical ramifications of potential disclosure must notify the Course Instructors prior to the end of the 2015 academic session.** Students who have questions about the University of Toronto Inventions Policy or the Ethical Conduct for Research Involving Humans policy should inquire with the Course Instructors.