DESCRIPTION

This course provides students with the opportunity to explore the interplay between innovative design and commercial success. Students will apply a human-centered design approach to understand why technologies succeed/fail, and to investigate how design iteration can lead to innovation when used as a tool to elicit and test a customer’s unspoken needs.

ENROLLMENT RESTRICTIONS

Enrollment in this course is restricted to graduate students in the Graduate Diploma in Engineering Leadership and Innovation, as well as any student that has obtained special permission to enroll in this course from the course instructor as well as the Graduate Chair (or equivalent) from the student’s home program.

INSTRUCTOR CONTACT INFORMATION

Course instructor: Dr. Jacob Reeves, Ph.D.
Email address: jreeves5@uwo.ca
Office hours: By appointment (flexible) – ACEB 3459

COURSE FORMAT

The course will be delivered face-to-face.

COURSE LOCATION/TIME

Wednesday mornings from 9:30am-12:30pm, in ACEB 1415

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will not change. Any remaining assessments will also be conducted online at the discretion of the course instructor.

TOPICS

<table>
<thead>
<tr>
<th>Topic #</th>
<th>Description</th>
<th>Learning Activities</th>
<th>Tentative timeline</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Innovation Process</td>
<td>• Lectures</td>
<td>Weeks 1-2</td>
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<tr>
<td></td>
<td>Lesson 1: What is Innovation?</td>
<td>• Additional reading material</td>
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<tr>
<td>2</td>
<td><strong>Human-Centered Design</strong></td>
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</tbody>
</table>
| Lesson 1: Design Thinking and Human-Centered Design | Lectures  
Additional reading material | Weeks 1-2 |
| Lesson 2: Insight Gathering | Lectures  
Problem Log | Weeks 1-4 |
| Lesson 3: Insight Statements | Lectures  
Interview assignment | Week 5 |

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<thead>
<tr>
<th>3</th>
<th><strong>Understanding Your Customer</strong></th>
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</table>
| Lesson 1: Customer Personas | Lectures  
Additional reading materials | Week 3 |
| Lesson 2: Customer Interviews | Lectures  
Workshop activities  
Interview assignment | Weeks 4-7 |
| Lesson 3: Emotional Design + Empathy | Lectures  
Workshop  
Additional readings | Weeks 5, 9 |

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<tr>
<th>4</th>
<th><strong>Prototyping for Design Feedback</strong></th>
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| Lesson 1: Hypothesis Driven Experimentation | Discussion  
Additional readings  
Assignment | Weeks 6-9 |
| Lesson 2: Rapid Prototyping for Innovation | Lesson  
Workshops  
Assignment | Week 6 |
| Lesson 3: Ideation + Hypothesis Sprint | Lessons  
Workshops  
Assignment | Weeks 7-9 |
| Lesson 4: Running a Feedback Session | Lesson  
Workshops | Weeks 7, 11 |

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<tr>
<th>5</th>
<th><strong>Impediments to Customer Driven Design</strong></th>
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</thead>
</table>
| Lesson 1: Improving Innovation | Lessons  
Additional readings  
Reflection assignment | Weeks 9-12 |
| Lesson 2: Open-Source Innovation | Lessons  
Discussion | Week 10 |
<table>
<thead>
<tr>
<th>Degree Level Expectation</th>
<th>Weight</th>
<th>Assessment Tools</th>
<th>Outcomes</th>
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</thead>
</table>
| Depth and breadth of knowledge | 20%    | • Class Contribution  
• Reflections + Discussions  
• Insights Report  
• Feedback Report | • Ability to identify the difference between innovation and invention, and interpret each in the context of engineering organizations  
• Understanding the major stages of the innovation process and leading their implementation  
• Understanding of the role of human-centered design in the innovation process  
• Manage and promote innovation in organizations  
• Understanding the value in utilizing hypothesis-focused prototypes to elicit customer insights  
• Identify the emotions evoked by design |
| Research & scholarship    | 15%    | • Class Contribution  
• Problem Log  
• Interview Assignment  
• Project Reports | • Synthesize innovation literature and suggest improvements to practice within teams and organizations  
• Ability to utilize empathy and interviews to elicit and identify unmet needs  
• Ability to identify the critical customers, collaborators and pathways needed to move design from invention to innovation  
• Ability to identify non-obvious users who may impact technology adoption |
| Application of knowledge  | 35%    | • Class Contribution  
• Persona Report  
• Ideation Workshop  
• Feedback Workshop | • Ability to initiate an innovative and customer-centric design process, and adapt innovation methods to unique circumstances  
• Ability to use a coherent approach to construct customer personas and problem storyboards  
• Ability to participate in/lead an ideation session  
• Ability to develop rapid prototypes and tests to capture customer feedback in response to design hypotheses/assumptions  
• Resolve conflict in a team environment when multiple solutions arise |
| Professional capacity / autonomy | 5%    | • Class Contribution  
• Interview Assignment  
• Feedback Workshop | • Defends own solutions and ideas in a professional and respectful manner  
• Ability to lead a user interview to elicit insights  
• Integrates reflection into his/her learning process  
• Integrates empathy into his/her design process |
| Communication skills      | 15%    | • Class Contribution  
• Project Reports  
• Case Study Discussions  
• Interview Assignment | • Ability to articulate evidence in support of defining a customer persona  
• Ability to clearly articulate the profile of a potential customer and their unique needs  
• Ability to communicate the innovation process steps effectively to business and technical/engineering audiences |
| Awareness of limits of knowledge | 10%    | • Class Contribution  
• Feedback Report  
• DT in Practice Reflection | • Awareness of the need to acknowledge assumptions and hypotheses in testing proposed solutions |
• Ability to acknowledge the limitations to the application of theoretical HCD processes in industrial/academic settings
• Ability to find additional resources and knowledge to implement innovative practices in engineering projects

### ASSESSMENTS

<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>Material Covered</th>
<th>Tentative Due Date</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Class Contribution (Participation in class activities) (Class preparation questions)</td>
<td>All topics</td>
<td>Ongoing</td>
<td>20%</td>
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<tr>
<td>Class Logbook (Weekly reflections)</td>
<td>All topics</td>
<td>Week of Feb 16th (feedback)</td>
<td>15%</td>
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<td>Week of Mar 30th (for marking)</td>
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<tr>
<td>Course Project</td>
<td>Topics 2 – 4</td>
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<td>55%*</td>
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<tr>
<td></td>
<td><strong>Problem Log</strong></td>
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<tr>
<td></td>
<td>(Individual)</td>
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<td></td>
<td><strong>Topic 2</strong></td>
<td>Week of Jan 26th</td>
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<td><strong>Need, Map + Persona Report</strong> (Team)</td>
<td>Topics 2 + 3</td>
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<td></td>
<td><strong>Interview Reflection</strong> (Individual)</td>
<td>Topics 2 + 3</td>
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<tr>
<td></td>
<td><strong>Interview + Insights Report</strong> (Individual)</td>
<td>Topics 2 + 3</td>
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<td></td>
<td><strong>Prototype Plan Reflection</strong> (Team)</td>
<td>Topic 4</td>
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<td><strong>Ideation + Hypotheses Report</strong> (Team)</td>
<td>Topic 4</td>
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<tr>
<td></td>
<td><strong>Feedback + Improvements Report</strong> (Team)</td>
<td>Topic 4</td>
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<td></td>
<td><strong>Design Thinking in Practice Reflection Paper</strong></td>
<td>Topic 5</td>
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<tr>
<td></td>
<td></td>
<td>Week of Mar 30th</td>
<td>10%</td>
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* 37% team deliverables, 18% individual deliverables

### Late Submissions:

- Assignments submitted within 24 hours of the due date/time will be accepted, but will receive a flat 20% deduction from the final mark
- Assignments submitted 24 hours or more after the due date/time will not be accepted unless official accommodations are provided

### Activities in which collaboration is permitted:

- Course project team reports
  - Problem Map + Persona, Interview + Insights, Ideation + Hypotheses, Feedback + Improvements
Teams should write/edit report together and divide/collaborate to develop and execute necessary tasks

- Course project materials development (Interview questions, Interviews, Prototype development, Feedback session, etc.)
- Teams are expected to divide work equitably then synthesize findings together

**Activities in which students must work alone (collaboration is not permitted):**

- Class contribution pre-class questions
- Class logbook
- Problem log, Interview reflection, Prototype plan reflection
- Design thinking in practice reflection paper

**REQUIRED TEXTBOOK**
Ivey Publishing Course Pack (print copy or digital download copy instructions will be provided in class)

**OPTIONAL COURSE READINGS**
Copies of additional material, beyond the course pack, will be provided in class.

**CHEATING, PLAGIARISM/ACADEMIC OFFENCES**
Academic integrity is an essential component of learning activities. Students must have a clear understanding of the course activities in which they are expected to work alone (and what working alone implies) and the activities in which they can collaborate or seek help; see information above and ask instructor for clarification if needed. Any unauthorized forms of help-seeking or collaboration will be considered an academic offense. University policy states that cheating is an academic offence. If you are caught cheating, there will be no second warning. Students must write their essays and assignments in their own words. Whenever students take an idea or a passage of text from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence. Academic offences are taken seriously and attended by academic penalties which may include expulsion from the program. Students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence at the following website: [https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf)

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com ([http://www.turnitin.com](http://www.turnitin.com)).

**CONDUCT**
Students are expected to follow proper etiquette to maintain an appropriate and respectful academic environment. Any student who, in the opinion of the instructor, is not appropriately participating in
course activities and/or is not following the rules and responsibilities associated with the course activities, will be reported to the Associate Dean (Graduate) (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Associate Dean (Graduate), the student could be debarred from completing the assessment activities in the course as appropriate.

HEALTH/WELLNESS SERVICES
As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Western provides several health and wellness related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. Information regarding health- and wellness-related services available to students may be found at http://www.health.uwo.ca/.

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. Faculty of Engineering has a Student Wellness Counsellor. To schedule an appointment with the counsellor, contact Kristen Edwards (khunt29@uwo.ca) via confidential email and you will be contacted by our intake office within 48 hours to schedule an appointment.

Students who are in emotional/mental distress should refer to Mental Health@Western: http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.

SICKNESS
Students should immediately consult with the Instructor (for a particular course) or Associate Chair (Graduate) (for a range of courses) if they have problems that could affect their performance. The student should seek advice from the Instructor or Associate Chair (Graduate) regarding how best to deal with the problem. Failure to notify the Instructor or the Associate Chair (Graduate) immediately (or as soon as possible thereafter) will have a negative effect on any appeal. Obtaining appropriate documentation (e.g., a note from the doctor) is valuable when asking for accommodation due to illness.

Students who are not able to meet certain academic responsibilities due to medical, compassionate or other legitimate reason(s), could request for academic consideration. The Graduate Academic Accommodation Policy and Procedure details are available at: https://www.eng.uwo.ca/graduate/current-students/academic-support-and-accommodations/index.html

ACCESSIBLE EDUCATION WESTERN (AEW)
Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program. Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are strongly encouraged to register with Accessible Education Western (AEW): http://academicsupport.uwo.ca/accessible_education/index.html

AEW is a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AEW and
their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.