

**ENGG160 – Introduction to Engineering Design, Communication, and Profession**

2 credits, 1 hour (in Class Lecture), 2 hours (Online Videos, Reading Materials, Games, Design Project and First Year Nights).

Fundamental design process; communication; teamwork; the engineering disciplines, career fields; professional responsibilities of the engineer including elements of ethics, equity, concepts of sustainable development and environmental stewardship, public and worker safety and health considerations including the context of the Alberta Occupational Health and Safety Act.

*Prerequisites and/or co-requisites: ENGL 199*

**Instructor**

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**Office hours**

Monday 10:00 - 11:50  
Tuesday 13:00 - 14:50  
Thursday 09:00 - 09:50

**Hours of Instruction**

Tuesday 18:00 - 18:50, Room S214

**Required Resources**

**MANDATORY TEXT: Designing Engineers: An Introductory Text**, ISBN: 978-1-119-12842-7 – S. McCahan, P. Anderson, M. Kortschot, P.E. Weiss, K.A. Woodhouse (Wiley). Available online: <https://www.wiley.com/en-ca/search?pq=978-1-119-12842-7%7Crelevance>

**Recommended (but not mandatory) Text: Introduction to Professional Engineering in Canada 5th ed.**, ISBN 978-0-13-420448-2 – G.C. Andrews, J.D. Aplevich, R.A. Fraser, C. MacGregor (Pearson). Available online: <https://www.vitalsource.com/en-ca/products/introduction-to-professional-engineering-in-gordon-c-andrews-v9780135240137>

**Course Outcomes**

Upon successful completion of the course, the student will be able to:

- Describe the concept and explain the importance of the engineering profession (and history), professionalism in engineering, roles of regulatory bodies (APEGA, Engineers Canada), professional skills and attitudes of engineers, Engineering Codes of Ethics, sustainability,

workplace (AOHSA) and product safety, standards, codes, and regulations, and impact of engineering solutions on environment and society. Demonstrate their knowledge as well as ethical and professional behavior in the term project.

- Describe the concept of Transdisciplinarity and the roles of different disciplines in multi-disciplinary engineering projects.
- Describe the general design process, stages, and design fundamentals and apply them to an open-ended problem in a term project.
- Recall different engineering programs of study offered at the U of A and choose the second-year program of study.
- Describe the general design activities and provide examples of designs and design products from different engineering disciplines. Recognize what components, sub-systems, and systems of various engineering products are and explain the difference between them.
- Name different forms of graphical communication used in different engineering disciplines (piping and instrumental diagrams, process flow diagrams, blueprints, electrical schematics, floor plan, etc.) from real-life.
- Describe the key principles of effective team functioning and demonstrate professionalism, teamwork, and project management skills, while working in teams on a term project.
- Demonstrate communication skills by communicating professionally with teammates and other project stakeholders, solving and/or avoiding conflicts, and by creating proper documentation (project proposal) and a video report of a term project.

**Evaluation**

Assessment	Weight	Equivalence
First-Year Nights (FYN) Reports (2)	10 Points	30% Homework
Self-Evaluation	4 Points	
Team-Evaluations (3)	12 Points	
Graduate Attribute (GA) Survey	4 Points	
Quizzes (10)	20 Points	30% Midterm
EHS Training (WHMIS)	5 Points	
EHS Training (ELO)	5 Points	
Proposal Letter (1/Group)	20 Points	40% Final Exam
Project Video Report (1/Group)	20 Points	
<b>TOTAL</b>	<b>100 Points</b>	<b>100%</b>

At least 65%, equivalent of grade C, is needed to pass the course. Students shall have multiple attempts on the quizzes.

**First-Year Nights (FYN) Reports**

In lieu of attendance of a minimum of 2 First-Year Nights, Keyano Engineering Students will submit two FYN Reports. The First FYN report, maximum two pages, will be a write-up on at least three engineering disciplines offered at UofA . The Second FYN Report, minimum two pages, will cover description and application of an engineering equipment used in Fort McMurray Oil Sand Industries (there is plenty of

information on Oil Sands Magazine Website - <https://www.oilsandsmagazine.com/>).

### **Self-Evaluation and Team-Evaluations**

As part of the course project, each student will complete a self-assessment at the beginning of the course as well as evaluate their project teammates' contributions and performance via a team assessment tool (ITP Metrics). Personal self-assessment will help student to understand their personality constructs, workplace strengths and weaknesses, and preferred learning style. There will be 3 team assessments; these will be open for 1 week and must be completed before the deadline. After each peer evaluation, students will receive anonymous and randomly-ordered scores and comments from their teammates.

### **Graduate Attribute (GA) Survey**

A GA Survey will be given to determine the self-assessed GA levels of students. These include Knowledge base, Problem analysis, Design, Individual & Teamwork, Communication Skills, Engineering tools and Life-long Learning. GA Survey link will be available under MOODLE.

### **Quizzes**

Quizzes shall be conducted online. In total there will be 10 videos and quizzes. Students have multiple attempts at the quizzes, which must be completed individually. Students can complete each quiz as many times as they wish until they score the highest (maximum) score. Quizzes may contain questions from the lectures, textbook and short MOODLE readings, and videos.

### **EHS Training (WHMIS and ELO)**

As a pre-requisite for second-year courses students must complete the WHMIS and Engineering Laboratory Orientation (ELO) safety training modules through the EHS at the University of Alberta. Students must upload both certificates of completion of each training to receive the full mark for these assignments.

### **Project Proposal Letter**

Students will submit a project proposal letter consisting of planning, customer needs, project goals and objectives. First, students will have to choose their project problem, which will come with background information and a set of the client's general requirements. It will be presented as a mini Request for Proposals (RFP). Using the client's requirements, students will have to develop engineering design requirements, including potential objectives and constraints. They have to summarize their work in a short written proposal (according to the rubric provided). Detailed instructions for each week will be found under MOODLE. Project rubrics will be also available on MOODLE.

### **Project Video Report**

The project video report should be no more than 5 mins, preferably 2 to 3 mins. It must present the visualized solution, explain, and defend its efficiency. The video report should be developed according to the rubric provided. Students are suggested to create a design logbook and take short notes and videos or photos every week to later put them into a video report. It is their responsibility to communicate effectively, manage the time for the project work, negotiate with each other, divide workload, and resolve any conflicts. The instructor will consult about the projects and answer questions on a weekly basis through the Ask Instructor FAQ Forum on MOODLE. Students will be required to work in groups to accomplish this report.

However, personal marks will be the same as the team marks to make students really work in teams and communicate, they can manage their own time and assign tasks to follow their team leader. The judging panel will be looking for creativity, relevance, clarity, efficiency, requirements fulfilled and use of design process.

### Grading System

Descriptor	Alpha Grade	4.0 Scale	Percent	Rubric for Letter Grades
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory <b>Progression</b>	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
<b>Minimum Pass</b>	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

Proposed Schedule of Topics

W#	Lecture Topics (1h/Week)	Online Learning (30 Mins/Week)	Project (1h/Week)	Assessment
1	Introduction to the Course, MOODLE, Discussion Forum, Grading & Project.	First-Year Nights (FYN) Schedule, Design & Program Videos, Reading 1 (Introduction to Engineering).	<b>Self-Evaluation</b> , Team assignment, Project Weekly Instructions, Topics, and Samples (see MOODLE)	Quiz 1
2	Introduction to Engineering Design	Reading 2a and 2b (Introduction to Communication, Engineering Design), McCahan pages*	Team Meeting, Role Assignment, Topic Selection	Quiz 2 <b>Self-Evaluation Due</b>
3	Planning Stage & Project Management, Problem Definition & Requirements	Read 3 (Introduction to Project Management), McCahan pages*, Research Tools & Project Management Tools	Project Management Decisions, Research, Problem Definition	Quiz 3 FYN Report 1 Due
4	Concept Development Stage 1: Idea Generation	Reading 4 (Introduction to Liability, Risk, DFX, Safety, Standards, Codes, and Regulations), How to use the Standards (Read), McCahan pages*	Concept Generation, Brainstorming, Developing Requirements, <b>Team-Evaluation 1</b>	Quiz 4 FYN Report 2 Due
5	Concept Development Stage 2: Idea Selection and Decision-Making Tools	Reading 5 (Introduction to Engineering Ethics), McCahan pages*	Evaluating Ideas and Decision-Making	Quiz 5 <b>Team-Evaluation 1 Due</b>
6	System-Level Design Stage and Detailed Design Stage, Design in Different Disciplines	Reading 6 (Introduction to Transdisciplinarity & Sustainability), McCahan pages*	PROJECT PROPOSAL	Quiz 6 Project Proposal Due
7	Introduction to Graphics & Technical Communication in various Disciplines	PDF Tips on Visual Communication, Sketching and Presentations Online Tips	Visualization of the Proposed Solution, <b>Team-Evaluation 2</b>	Quiz 7
8	Implementation & Testing Stage and Production Stage, Design Project End	Introduction to Workplace Safety and AOHSA, EHS Trainings (WHIMS, ELO)	Visualization of the Proposed Solution	Quiz 8 <b>Team-Evaluation 2 Due</b>
9	Real-life Industrial Practice (Video)	Life-Long Learning (Video)	Revision, Refinement, Corrections, Iterations	Quiz 9
10	Guest Lecture – Engineer’s Design Thinking	<b>GA Survey</b>	Video Production	<ul style="list-style-type: none"> <li>Quiz 10</li> <li>All Readings, Design &amp; Program Videos And Quizzes Due</li> </ul>

11	Faculty Lecture – Choosing Second-year Program, Co-Op, Minors	SECOND-YEAR PROGRAM SELECTION	Video Production	
12	Equity & Diversity in Design		Video Production Team-Evaluation 3	Second-Year Program Selection Due
13	Guest Lecture: APEGA		PROJECT VIDEO REPORT	<ul style="list-style-type: none"> <li>• GA Survey Due</li> <li>• EHS Training Due</li> <li>• Project Video Report Due</li> <li>• Team-Evaluation 3 Due</li> </ul>

**Please Note:**

Date and time allotted to each topic is subject to change.

## Performance Requirements

### Student Responsibilities

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College credit calendar.

More specific details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

### Laboratory Safety

In the science laboratories, safety is important.

Students must complete the *WHMIS for Students* online training course on Moodle before entering the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

### Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a students' learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

### Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of

Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on [ilearn.keyano.ca](http://ilearn.keyano.ca). Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate.

### Specialized Supports

The Student Academic Support Services (SASS) department: Accessibility Services, Skill Centre, Wellness Services and Student Life Department work together to support student success at Keyano College.

**Accessibility Services (CC167)** supports student success through group and individualized instruction of learning, study and test taking strategies, and adaptive technologies. Students with documented disabilities, or who suspect a disability, can meet with the Learning Strategists to discuss accommodation of the learning barriers that they may be experiencing. Students who have accessed accommodations in the past are encouraged to visit our office at their earliest opportunity to discuss the availability of accommodations in their current courses. Individual appointments can be made by calling 780-791-8934.

**Skill Centre (CC119)** provides a learning space where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff. Students visiting the centre have access to one-to-one or group tutoring, facilitated study groups, and assistance in academic writing. The Skill Centre's Peer Tutor program provides paid employment opportunities for students who have demonstrated academic success and want to share what they have learned. Tutoring is available free to any students registered at Keyano College on a drop in basis, from 8:30 am to 5:00 pm Monday through Friday. Additional evening hours are subject to tutor availability and are posted in the Skill Centre.

**Wellness Services (CC260)** offers a caring, inclusive, and respectful environment where students can access free group and individual support to meet academic and life challenges. Mental Health Coordinators offer a safe and confidential environment to seek help with personal concerns. The Mindfulness Room in CC260 is available as a quiet space for students to relax during regular office hours. Wellness Service welcomes students to participate in any of the group sessions offered throughout the academic year addressing such topics as Mindfulness and Test Anxiety. Individual appointments can be made by calling 780-791-8934.

**Student Life Department (CC210)** is a place for students to go when they don't know who else can answer their questions. The staff will help students navigate barriers to success and if they don't know the answer, they will find it out. Student success is directly affected by how connected a student feels to their college. The student life department is there to help students get connected.

**Please watch your Keyano email for workshop announcements from our Student Academic Support Services team.**