NORTHWESTERN POLYTECHNIC

DEPARTMENT OF SCIENCE

COURSE OUTLINE – Winter 2026

EG1600 (A3): Introduction to Engineering Profession, Design, and Communication – 2 (1-0-3) 60 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR:	Braden Kelly	**PHONE:**	780-539-2963
OFFICE:	J218	**E-MAIL:**	bkelly@nwpolytech.ca
OFFICE HOURS:	TBA		

CALENDAR DESCRIPTION:

Fundamental design process and theory in a multidisciplinary context. Importance, in engineering design, of communications; 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.

PREREQUISITE(S)/COREQUISITE:

Corequisite: EN1990

REQUIRED TEXT/RESOURCE MATERIALS:

There are no required textbooks.

DELIVERY MODE(S):

Lecture: Thursday 1:00-1:50AM, room J204.

Laboratory: Thursday 2:30-5:20, room E306

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LEARNING OUTCOMES:

- Team Structures & Roles
  Distinguish between transdisciplinary and multidisciplinary teams and explain the roles of different engineering disciplines in collaborative projects.
- Engineering Designs & Systems
  Identify examples of designs across engineering fields and distinguish components, sub-systems, and full systems within engineering products.
- Engineering Design Process
  Apply the complete design process—from identifying a need to proposing and documenting a solution—using research, constraints, creativity, evaluation of alternatives, decision-making, and communication of the final design.
- Graphical Communication
  Recognize and describe common engineering drawings and graphical communication tools (e.g., P&IDs, PFDs, blueprints, schematics, floor plans, component diagrams).
- Teamwork, Leadership & Professional Skills
  Apply principles of effective teamwork, project management, ethics, self-reflection, conflict resolution, and leadership within a team design project.
- Engineering Communication
  Communicate professionally with teammates and stakeholders and produce required written and video deliverables for the term project.

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page http://www.transferalberta.alberta.ca.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.**

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EVALUATIONS:

Assessment	Weight	Due Date	Notes
Proposal Letter (1/group)	30 points	Week 6	Project major deliverables; minimum 50% on each to pass course
Video Report (1/group)	35 points	Week 12	
Sketch	10 points	Week 9	Individual
Check in Submissions (log book)	10 points	Weekly	Project Participation. Self and Team logbook entries.
2 Team-Evaluations	5 points each	Week 6 & 13	Team assessment to assess contributions
Design Competition	5 points	Week 7 & 8	Hands on creativity
Total	**100 points**		**100%**

GRADING CRITERIA:

Alpha Grade	4-Point Equivalence	Percentage Conversion (unless otherwise specified in the Course Outline)	Descriptor
CR	N/A	50-100	Credit
NC	N/A	0-49	No Credit

Students must achieve at least 65% overall, have attended > 90% of all lectures and 100% of labs, and achieved at least 50% on each assessment. Students must also receive satisfactory team evaluations.

Project Teams: Teams will be randomly created using a simple Python sorting algorithm.

Project Problems: The project topics will be provided to students and groups can work together to decide which group will do each project. Only one group per project.

Project Proposal: 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 D2L. Project rubrics will be also available on D2L.

Project Video Report: The video report should be no more than 5 mins, preferably 2 to 3 mins. The video must introduce the team and the project, provide a visual solution and an explanation for the solution and why it is a good one. A rubric is provided.

Software Requirements: MS Office or equivalent, MS Visio or equivalent, Adobe reader and any free video maker. Students may download AutoCAD for free from the NWP software website.

Team-Evaluations: As part of the course project, each student will evaluate their project teammates' contributions and performance via a team assessment tool (ITP Metrics). There will be 2 team assessments. After each peer evaluation, students will receive anonymous and randomly-ordered scores and comments from their teammates.

COURSE SCHEDULE/TENTATIVE TIMELINE:

The following schedule is based on the ENGG 160 schedule at the University of Alberta and may be altered throughout the course as the instructor sees fit.

Week	Lectures & Corresponding Daily Project Team Activities	Project Work in Groups
1	Course Introduction	Read Project Instructions Project Instructions 1 Check team assignment, contact teammates, Choose the team leader, Look at Project Topics (RFPs)
2	Introduction to Engineering Design Team role assignment & picking a project	Project Instructions 2 Team Meeting **Team roles and project selection submission**
3	Planning Stage (Problem Definition, Requirements) Project Management Team: Problem Definition, listing requirements	Project Instructions 3 Project Management Decisions **Submit the preliminary problem definition and requirements for the selected project**
4	Concept Development 1: Idea Generation Team: Brainstorming session	Project Instructions 4 **Submit results of the Brainstorming Session** (min. 3 different alternatives)
5	Concept Development 2: Idea Selection, Decision-Making Team: Decision-making process and iteration of concept	Project Instructions 5 **Submit the decision-making process notes**
6	System-Level and Detailed Design Design in Different Disciplines	Project Instructions 6 **Team Evaluation 1**

	Team: Identification of project aspects that fall under different disciplines	PROJECT PROPOSAL DUE
7	Hands-on Build Competition in class: Teams showcase to their TAs their deliverables	Project Instruction 7 Visualization of the Proposed solution
8	Hands-on competition	Project Instruction 7
9	Introduction to Graphics & Technical Communication in various Disciplines Team: Sketching the solution, working on the visual representation	Project Instruction 7 **Submit Sketches**
10	Implementation & Testing Stage Design Project End – Part 1 Design iteration Team: Design Iteration activity and Improvement	Project Instructions 8 **Submit scripts for the Video Report**
11	Production Stage Design Project End – Part 2 Design iteration	Project Instructions 8 **Submit feasibility assessment and iterations notes**
12	Design Project End – Part 3 Design iteration	Project Instructions 9 VIDEO REPORT IS DUE
13	Whole class: watching video reports	**Team Evaluation 2**

STUDENT RESPONSIBILITIES:

The course is structured around the term project, which requires students to apply engineering design principles and though processes. The project will focus on the first 2 stages of the design process that students will learn in class – Planning (Problem Definition) & Concept Development. It also requires basic analysis, creative and innovative approach, and utilization an appropriate forum where they can experiment and prototype. Students are expected to work in groups of 6-7 people and recognize the importance of teamwork.

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at https://www.nwpolytech.ca/about/administration/policies/index.html.
**Note: all Academic and Administrative policies are available on the same page.

Additional Information (Optional):

Engineers Rule The World (ERTW).