ORIGINAL COURSE IMPLEMENTATION DATE: September 2021

REVISED COURSE IMPLEMENTATION DATE:

COURSE TO BE REVIEWED (six years after UEC approval)**:** February 2027

Course outline form version: 05/18/2018

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ENGR 123	**Number of Credits:** 4 Course credit policy (105)

Course Full Title: Engineering Design I: Design and Drafting

Course Short Title: Engineering Design I

(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)

Faculty: Faculty of Applied and Technical Studies	**Department (or program if no department):** Physics

Calendar Description:

Introduces students to the engineering design process through individual exercises and a series of mini-projects and labs undertaken in groups. Students will study the engineering design process, relevant technical background (including engineering drawing and CAD tools), project/group dynamics, professional responsibility, and writing and presentation skills over the course of the term.

Note: Students with credit for ENGR 151 cannot take this course for further credit.

Prerequisites (or NONE):	None
Corequisites (if applicable, or NONE):	None
Pre/corequisites (if applicable, or NONE):	ENGL 105, MATH 111, PHYS 111, and one of ENGR 153 or COMP 152.

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number: **ENGR 151**

Cross-listed with:

Dual-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar hours	45
Tutorials/workshops	
Supervised laboratory hours	30
Experiential (field experience, practicum, internship, etc.)	
Supervised online activities	
Other contact hours:	
Total hours	**75**

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Special Topics *(Double-click on boxes to select.)*

This course is offered with different topics:

☒ No ☐ Yes *(If yes, topic will be recorded when offered.)*

Independent Study

If offered as an Independent Study course, this course may be repeated for further credit: *(If yes, topic will be recorded.)*

☒ No ☐ Yes, repeat(s) ☐ Yes, no limit

Transfer Credit

Transfer credit already exists: *(See **bctransferguide.ca**.)*

☒ No ☐ Yes

Submit outline for (re)articulation:

☐ No ☒ Yes *(If yes, fill in transfer credit form.)*

Grading System

☒ Letter Grades ☐ Credit/No Credit

Maximum enrolment (for information only): 24

Expected Frequency of Course Offerings:

Fall Only *(Every semester, Fall only, annually, etc.)*

Department / Program Head or Director:	**Date approved:**	December 2020
Faculty Council approval	**Date approved:**	January 8, 2021
Dean/Associate VP:	**Date approved:**	January 8, 2021
Campus-Wide Consultation (CWC)	**Date of posting:**	February 19, 2021
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	February 26, 2021

Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Describe the concept of a profession and the unique aspects of the engineering profession.
- Describe the different engineering disciplines.
- Apply engineering decision-making and design processes to well-defined and well-constrained engineering problems.
- Apply scientific principles to the understanding and analysis of engineering problems, and to the design of potential solutions.
- Describe the use of prototyping in the engineering design process.
- Describe the contributions that an engineer can make to society as well as the impact (both positive and negative) that an engineering project can have on society.
- Participate equitably as a member of a team, demonstrating initiative, professionalism, and effective intra-team communication.
- Prepare and deliver effective technical poster presentations, oral presentations, and technical reports.
- Demonstrate ability to draw engineering 2D sketching and Orthographic.
- Demonstrate ability to draw engineering 3D Isometric and perspective sketches.
- Prepare electronic drawings using CAD tools.
- Apply engineering tools, including hand tools, prototyping tools, and software tools to create, test, and analyze physical embodiments of an engineering design.

Prior Learning Assessment and Recognition (PLAR)

☐ Yes ☒ No, PLAR cannot be awarded for this course because content and instruction are mandated by governing body.

Typical Instructional Methods *(Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.)*

Lecture, tutorial work, group projects, invited speakers, field trips.

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials *(If more space is required, download Supplemental Texts and Resource Materials form.)*

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Dunwoody, B et.al.	Fundamental Competencies for Engineers	☒	Oxford	
2.	Lockhart, S.D. et.al	Engineering Design Communication	☒	Pearson	2012
3.			☐		
4.			☐		
5.			☐		

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

Typical Evaluation Methods and Weighting

Final exam:	35%	Assignments:	15%	Field experience:	%	Portfolio:	%
Midterm exam:	15%	Project:	25%	Practicum:	%	Other:	%
Quizzes/tests:	10%	Lab work:	%	Shop work:	%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

Module 1: Engineering profession

Module 2: Engineering design process

- Introduction to team work
- Communication
- Engineering design process
- Engineering fundamentals

Module 3: Engineering drawing

- Isometric / orthographic
- Computer Aided Drawing
- 3D rendering / prototyping tools