

## ENGR 195: Introduction to Engineering Design

Course: ENGR 195 – Introduction to Engineering Design, 2019 S  
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### Course Description

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Students will be introduced to and apply the principles of engineering design through practical projects undertaken by student teams. Course content and exercises will provide students with exposure to the entire design process from needs assessment through to final testing and documentation. All projects will involve design, prototyping, construction, troubleshooting and testing to meet a specific design goal. To find out where this course transfers, check the BC Transfer Guide at <http://bctransferguide.ca>.

Offered: Summer, 2019  
Credit: 4.0  
In-Class Workload: 4 Hours Lecture, 4 Hours Seminar, 4 Hours Lab  
Out-of-Class Workload: 4 Hours  
Prerequisites: ENGL 151

### Intended Learning Outcomes

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Upon successful completion of this course a student will be able to:

1. Follow a design process to develop a solution to an engineering design problem;
2. State the design problem;
3. Perform research to identify relevant background information and prior art;
4. Develop innovative solutions to design problems using creative thinking processes;
5. Apply formal design processes to help choose between alternative conceptual designs;
6. Follow a structured process to design a system consisting of mechanical, electrical, computer and/or software subsystems;
7. Apply discipline-specific technical knowledge during the design process and demonstrate understanding of relevance of that knowledge to the disciplines in professional practice;
8. Demonstrate teamwork skills while working toward the successful completion of the design projects;
9. Identify business, environmental and regulatory considerations relevant to an engineering design project; and
10. Apply effective time and resource management tools in the context of an engineering design project.

### Textbook

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The Engineering Design Process: An Introduction for mechanical engineers. (2010) – by P. Ostafichuk, etc.

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### Evaluation & Grading System (Subject to modification, if necessary)

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Participation is mandatory  
Lectures 30%  
Seminars 35%  
Labs 35%

<b>A+</b>	90 - 100%	<b>B-</b>	70 - 72%
<b>A</b>	85 - 89%	<b>C+</b>	65 - 69%
<b>A-</b>	80 - 84%	<b>C</b>	60 - 64%
<b>B+</b>	77 - 79%	<b>D</b>	50 - 59%
<b>B</b>	73 - 76%	<b>F</b>	< 50%

### College Supports, Services and Policies

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#### Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

#### College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

#### College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

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Course Outline (subject to modification, if necessary)

Wk	Date	Lecture	Topic	Date	Seminar	Date	Lab
1	May 06 May 09	Chapter 1 Introduction to Design Chapter 5 Team Dynamics Chapter 14 Needs and Specification	<ul style="list-style-type: none"> <li>• Introduction of the Project</li> <li>• Team Formation</li> <li>• Design process</li> </ul>	May 07 May 08 May 09	Introduction to SolidWorks Introduction of the Project Parts	May 07 May 08	<ul style="list-style-type: none"> <li>-Workshop/Workplace Rules and Safety Observation Tour Notes.</li> <li>-Introduction to C-Thru Engin-CTE1 (Parts list/ assembly drawing and the Engine mechanism)</li> <li>- Measurement tools and Dimensional factors and tolerances</li> <li>-How to operate Milling and Lathe machines and the difference between them.</li> <li>- Teamwork Projects Time Tracking and production plan.</li> </ul>
2	May 13 May 16	Chapter 4 Project Management Chapter 2 Conceptualization Chapter 3 Evaluation	<ul style="list-style-type: none"> <li>• Project Management</li> <li>• Evaluation and decision making</li> </ul>	May 14 May 15 May 16	Introduction to SolidWorks Assemblies	May 14 May 15	Manufacturing instruction, parts production and measurement: 1-Base mount
3	May 23	May 20 No Class – Stat Holiday Chapter 7 Prototyping	<ul style="list-style-type: none"> <li>• Prototyping</li> </ul>	May 21 May 22 May 23	Introduction to SolidWorks 2D Drawings	May 21 May 22	Manufacturing instruction, parts production and measurement: 2-Cylinder plate
4	May 27 May 30	Chapter 10 Mechanical Components Chapter 13 Manufacturing Parts	<ul style="list-style-type: none"> <li>• Mechanisms</li> <li>• Making parts</li> <li>• Material selection</li> </ul>	May 28 May 29 May 30	Project	May 28 May 29	Manufacturing instruction, parts production and measurement: 3-Cylinder part 4- Crank desk
5	Jun.03 Jun.06	Chapter 19 Failure Modes Chapter 20 Design for X	<ul style="list-style-type: none"> <li>• Optimization</li> <li>• Mitigating failure</li> <li>• Design for manufacture, assembly, and usability</li> </ul>	Jun.04 Jun.05 Jun.06	Project	Jun.04 Jun.05	Manufacturing instruction, parts production and measurement: 5-FlyWheel and Crankshaft 6- Piston
6	Jun.10 Jun.13	Chapter 21 Intellectual Property  Question & Answer Session	<ul style="list-style-type: none"> <li>• Societal context</li> <li>• Patents and bringing ideas to market</li> </ul>	Jun.11 Jun.12 Jun.13	Project	Jun.11 Jun.12	Engine-fitting and assembly
7	Jun.17 Jun.20	Final Presentation Preparation	<ul style="list-style-type: none"> <li>• PPT (~5 mins)</li> <li>• Final Presentation</li> </ul>	Jun.18 Jun.19 Jun.20	Project  Pizza Party TEC 175 Jun.20 Lunch time	Jun.18 Jun.19	Rework and Engine test