



**Faculty of Engineering**  
**Department of Mechanical Engineering**  
**COURSE OUTLINE**

**MECH350 – Engineering Design I**

**Term – SPRING 2017 (201701)**  
<http://www.engr.uvic.ca/~mech350>

Instructor	Office Hours
Dr. N. Dechev	Days: Wed
Phone: (250) 721-8933	Time: 12:30 – 1:30 pm
E-mail: <a href="mailto:dechev@uvic.ca">dechev@uvic.ca</a>	Location: EOW 517

**Prerequisites:** One of (MECH 200, ELEC 200, ELEC 299); and MECH 220; and MECH 285; and ELEC 250; and STAT 254 or STAT 260. **Co-requisites:** MECH335

**LECTURE DATE(S)**

Section: A / <b>CRN22162</b>	Days: Mon, Thurs	Time: 11:30 am - 12:50 pm	Location: HSD A240

**TUTORIAL SECTIONS**

Section: T01	Days: Thurs	Time: 1:30 pm - 2:20 pm	Location: Hickman 105

**DESIGN MEETING (LAB) SECTIONS**

Section: B01	Days: Wed	Time: 1:30 pm - 4:20 pm	Location: ELWA127

This time is devoted for the course instructor/TAs to meet with student groups individually, to discuss their specific needs regarding the design projects. Group meeting times are available on the webpage: <http://www.engr.uvic.ca/~mech350>

TA Name	E-mail	Office
Nicholas Bruce	<a href="mailto:nsbruce@uvic.ca">nsbruce@uvic.ca</a>	ELW 402, Time: by email.
Mehran Farhadmanesh	<a href="mailto:mehranf@uvic.ca">mehranf@uvic.ca</a>	ELW B156: Mon,Thur 1:00-4:00 pm
Nouman Zubair	<a href="mailto:nouman@uvic.ca">nouman@uvic.ca</a>	TBA, Time: Tues, 2:30 – 3:30 pm
Michaela Thomas	<a href="mailto:michaelathomas@uvic.ca">michaelathomas@uvic.ca</a>	MSB 336: Thurs, 10:30-11:30 am.

Required Text	Optional Text(s):
Title: Fundamentals of Engineering Design, 2nd Edition	<i>Product Design: Techniques on Reverse Engineering and New Product Development</i> , K. Otto and K. Wood, ©2001.
Author: Barry Hyman	<i>Engineering Design Methods, Strategies for Product Design</i> , N. Cross, 2 <sup>nd</sup> Edition, John Wiley & Sons, ©1989.
Publisher/Year: Prentice Hall, ©2003	<i>Engineering Design</i> , G. Dieter, McGraw Hill, ©2000.

**COURSE OBJECTIVES:**

This course focuses on Design Methodology; recognizing and defining open ended engineering problems, generating creative solutions, modeling, analysis, synthesis, prototyping and testing. Students will work in groups to complete one minor design project, and one major design project. In addition, students will be examined by two examinations, module-I exam and module-II exam.

**Lecture Hours:**

will be devoted to introducing, reviewing, and discussing the course material. It is the responsibility of the student to attend lectures and observe the progress of the course. Students should note that information/changes/new-requirements regarding the design projects, reports, assignments, and the module examinations will be discussed during lectures, and possible changes made.

**Tentative Lecture Topics to be Covered:**

Topic:	Lecture #:	Textbook Chapter:
Course Intro, Intro to Engineering Design	1	1
Problem Formulation (Needs, Goals and Objectives), Info. Gathering	2	2
Info. Gathering with Reverse Engineering	3	Lecture Notes
Concept Generation	4, 5	3, 6
Project Planning (Gantt, CPM, PERT)	5, 9	7
Teamwork	6	Lecture Notes
Decision Making (Concept Selection)	7, 8	5, 9
Economics and Intellectual Property	10, 11	Lecture Notes
Detailed Design (Modeling, DFM)	12, 13, 14	10, Lecture Notes
Testing & Evaluation	15	Lecture Notes
Sustainable Engineering	16	Lecture Notes
Professional and Social Context of Engineering	17	4
Guest Lectures from Industry	TBA	
Guest Lectures from Industry	TBA	

**Design Project:**

Major Design Project forms basis of this course. Please see the course web-site for specific information.

**Assignments/Exercises:**

The assignments/exercises include problems from the textbook and other material. No marks are assigned for the assignments, however, it is strongly recommended that students complete the assignments, to prepare students for the module examinations and completion of the final project report. Students are encouraged to review additional textbook problems, beyond those assigned.

**Tutorial:**

The tutorial will provide students with a chance to review/practice assignments/exercises with the instructor or teaching assistants, and ask questions regarding the class material. Although the tutorials are not compulsory, students are encouraged to attend the tutorial.

**Design Studio Location and Hours:**

- ELW A127, 7 Days a week 7:00 am – 12:00 midnight

The MECH350 Design Studio is an open space for students to meet, work on designs, and has various hand tools and woodworking tools (drill press, drills, and scrollsaw). Students must follow the DESIGN STUDIO RULES, as posted on the MECH350 Website <http://www.engr.uvic.ca/~mech350>. Failure to follow the rules may lead to immediate loss of access to the Design Studio.

**Design Meetings (Compulsory):**

- ELW A127, Wednesday, 1:30 pm – 4:30 pm (for 15 minutes/group)

This time is devoted for the course instructor/TAs to meet with student groups individually, to discuss their specific needs regarding the design projects.

**Machine Shop Sessions:**

- ELW B103, Mon, Tues, Wed, Thurs, Friday (see below) 1:00 pm – 6:00 pm

This time is devoted to students for use of the machine shop facility to construct physical prototypes of their design projects, under the supervision of the machine shop staff. Students must attend a safety orientation session prior to using the machine shop. Please see Document “MECH350+BME350-Key-Dates-2017” available on available on the webpage: <http://www.engr.uvic.ca/~mech350> for further information on dates.

**LEARNING OUTCOMES:** At the end of this course, students will be able to:

- Understand and apply the engineering design process/methodology;
- Formulate a problem definition and goals/objectives for a design activity;
- Generate and evaluate conceptual design ideas using systematic tools;
- Apply mathematical methods for the analysis and planning of engineering design;
- Participate effectively in teamwork during engineering design;
- Produce a physical, functional prototype of the design;
- Test, evaluate and document the performance of the prototype;
- Prepare professional reports, and deliver an oral presentation of the design activity;
- Understand the ethical and social implications of engineering work;

**For success, the student should:**

- Attend all lectures and design meetings;
- Complete all assigned readings;
- Attend all student presentations;
- Devote an additional 3 hours of study per week;
- Participate in the oral presentations;
- Successfully complete the Major Design Project and required reports;
- Successfully complete the assignments;
- Successfully complete the Module I and Module II Examinations.

**The instructor and teaching assistants will provide feedback on:**

- The Major Design Project (continuous feedback);
- The Module I and Module II examinations;
- The Major Design preliminary report, conceptual design report, and final design report;
- Your contribution to the team, as evaluated by your team members;
- Oral presentation and demonstration of the final design.

<b>Weight &amp; Date(s) of Assessments:</b>	<b>Weight</b>	<b>Date</b>
Assignments	Not marked	
Module I Examination	20%*	See “...Key-Dates-2017” document
Module II Examination	20%*	See “...Key-Dates-2017” document
Major Project	55%	See “...Key-Dates-2017” document
• Preliminary Report	(8/55)	
• Conceptual Report	(12/55)	
• Final Design Report	(15/55)	
• Final Presentation & Prototype	(20/55)	
Peer Review & Participation	5%	

\* NOTE: a passing grade (50%) is required for the combined exam mark (Module I Exam and the Module II Exam). Failure to pass the combined exam mark will result in a failing grade for the course.

**There will be no supplemental examination for this course.**

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Undergraduate Calendar.

**COURSE LECTURE NOTES**

Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.

**GENERAL INFORMATION**

**Note to Students:**

Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Secretary to set up an appointment.

**Attendance**

Students are expected to attend all classes in which they are enrolled. An academic unit may require a student to withdraw from a course if the student is registered in another course that occurs at the same time....

An instructor may refuse a student admission to a lecture, laboratory, online course discussion or learning activity, tutorial or other learning activity set out in the course outline because of lateness, misconduct, inattention or failure to meet the responsibilities of the course set out in the course outline. Students who neglect their academic work may be assigned a final grade of N or debarred from final examinations.

Students who do not attend classes must not assume that they have been dropped from a course by an academic unit or an instructor. Courses that are not formally dropped will be given a failing grade, students may be required to withdraw and will be required to pay the tuition fee for the course." UVic Calendar, (2015) <http://web.uvic.ca/calendar2015-09/FACS/UnIn/UARe/Atte.html>

**Accommodation of Religious Observance (AC1210)**

<http://web.uvic.ca/calendar2015-09/GI/GUPo.html>

**Discrimination and Harassment Policy (GV0205)**

<http://web.uvic.ca/calendar2015-09/GI/GUPo.html>

**Faculty of Engineering, University of Victoria  
Standards for Professional Behaviour**

*"It is the responsibility of all members of the Faculty of Engineering, students, staff and faculty, to adhere to and promote standards of professional behaviour that support an effective learning environment that prepares graduates for careers as professionals...."*

You are advised to read the Faculty of Engineering document [Standards for Professional Behaviour](#) which contains important information regarding conduct in courses, labs, and in the general use of facilities.

<http://www.uvic.ca/engineering/current/undergrad/index.php#section0-23>

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the Undergraduate Calendar for the UVic policy on academic integrity.

**Policy on Academic Integrity**

<http://web.uvic.ca/calendar2015-09/FACS/UnIn/UARe/PoAcl.html>