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APSC 171 (3) Engineering Drawing and CAD/CAM

Contact information

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Academic Calendar Entry

Orthographic projections, axonometric and perspective projections, dimensioning and tolerances, computer-aided design and modeling, introduction to rapid prototyping, team-based design project. Credit will not be granted for both APSC 171 and APSC 170. [3-0-2]
Prerequisite: None

Additional Course Requirements

Students must complete two group projects namely; Sheet metal and final design 3D printing.

Course Format

- Three lecture-hours each week
- The student's performance will be assessed based on ten assignments, two design projects, one midterm, and final exam

Course Overview

Engineering Drawing and CAD/CAM aims to develop engineering drawing skill as an essential engineering communication tool commonly use among engineers. This course also teaches "metaskills": those abilities that engineers develop that enable them to analyze situations, design solutions, complete projects, identify their professional responsibilities, and communicate technical information. These abilities are learnt by doing, so this course emphasizes projects and diverse tutorial assignments. There is an emphasis on group work because students learn best from each other and likewise engineers will work in groups throughout their careers.

This course is organized around the major design project. Conceiving and completing this project, like all major engineering undertakings, requires a variety of sub-activities, and so the course covers a large range of topics.

Course Content and Objectives

1. The aim of this course is to present the principles of engineering drawing (2D and 3D) using instruments and computer, SolidWorks.
2. Introducing the principals of engineering design including the following steps:
 - Identify/Define a Problem
 - State Constraints and Specifications
 - Research the Problem



- Alternative Solutions
 - Final Solution
 - Modeling
 - Prototyping (3D printing)
 - Testing and Evaluation
 - Communicate and Documentation
3. Project based learning and team activities
 4. Improving student technical communication skill through several group discussions and final design report

Learning Outcomes

By completion of this course, students will be able to:

- 1- Demonstrate ability to draw engineering 2D sketching and Orthographic
- 2- Demonstrate ability to draw engineering 3D Isometric and perspective sketches
- 3- Utilize SolidWorks as a powerful engineering drawing/modeling tool to create engineering drawings
- 4- Utilize the concept of engineering design cycles (starting from conceptualization to final design documentation step) in order to complete final project (3D printing)
- 5- Demonstrate ability to work in a team, participate in group discussion and technical communication in order to succeed in group projects.

Evaluation Criteria and Grading

<i>Task</i>	<i>Percentage of the Total Mark</i>
Assignments (Total of Ten Assignments)	10% (Individual & Group)
Midterm Exam	20% (Individual)
Sheet Metal Project	12.5% (Group)
Final Project (Presentation and report)	17.5% (Group)
Final Exam*	40% (Individual)
Professionalism + Raybucks	5% (Individual)
Total	105% (70% Individual+ 35% Group)

* Minimum of 40% in final exam is required to pass this course

Required Readings and Videos

- Customized version of Engineering Graphics, A problem Solving Approach, Don McAdam and Roger Winn
- Customized workbook, Engineering Graphics, A problem Solving Approach, Don McAdam and Roger Winn
- A series of over 20 pre and post lecture online screencasts on SolidWorks and other taught topics available on YouTube. Students are highly encouraged to view these videos prior to attend lectures.



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Recommended Additional Readings

Technical Drawing 101 3rd Edition, A multidisciplinary Curriculum for the First Semester, D smith and A Ramierz

Final Examinations

The examination period for **Term 1 of Winter 2017 is Dec 4 to 19**. Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 24-hour period) or unforeseen events, students will be permitted to apply for out-of-time final examinations only if they are representing the University, the province, or the country in a competition or performance; serving in the Canadian military; observing a religious rite; working to support themselves or their family; or caring for a family member. Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges that arise during a term and changes in the requirements of an ongoing job.

Further information on Academic Concession can be found under Policies and Regulation in the *Okanagan Academic Calendar* <http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0>.

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar at <http://okanagan.students.ubc.ca/calendar/index.cfm?tree=3,54,111,0>.

Disability Services

The Disability Resource Centre ensures educational equity for students with disabilities, injuries or illness. If you are disabled, have an injury or illness and require academic accommodations to meet the course objectives, please contact Earllene Roberts, the Diversity Advisor for the Disability Resource Centre located in Commons Corner in the University Centre building (UNC 227).

UBC Okanagan Disability Resource Centre:

UNC 227A 250.807.9263

email earllene.roberts@ubc.ca

Web: www.ubc.ca/okanagan/students/drc



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Ombuds Office

The Ombuds Office offers independent, impartial, and confidential support to students in navigating UBC policies, processes, and resources, as well as guidance in resolving concerns related to fairness.

UBC Okanagan Ombuds Office:

UNC 227B 250.807.9818

email: ombuds.office.ok@ubc.ca

Web: <http://ombudsoffice.ubc.ca/ubc-okanagan-2/>

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UBC Okanagan Equity and Inclusion Office:

UNC 227C 250.807.9291

email: equity.ubco@ubc.ca

Web: www.ubc.ca/okanagan/equity

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<http://www.ubc.ca/okanagan/students/campuslife/safewalk.html>