EXPANDED COURSE DESCRIPTION
MECHANICAL ENGINEERING
Lassonde School of Engineering
Mechanical Engineering
LE / MECH 3401 3.0 SECTION M
MINI DESIGN PROJECT 2
FALL 2017 / WINTER 2018

COURSE CALENDAR DESCRIPTION

This project-based course involves a semester-long team project that is limited in scope, but open-ended and/or requiring multiple solutions. Students will also practice advanced machining techniques and apply them to fabricate parts in their projects. Lecture sessions are designed to provide complementary training in different areas of project execution such that students will be well prepared to succeed in their final year capstone project. Students have the option of choosing a project in any area of mechanical engineering; they are also encouraged to work in partnership with industry, consult a practicing engineer, and/or collaborate with students from a technical college. Evaluation criteria include written and oral communications of technical solutions, as well as economic analysis and/or other analyses related to entrepreneurial opportunities. Prerequisites: LE/MECH 2201 3.0; LE/MECH 2412 3.0 or LE/MECH2402 2.0; LE/MECH 2502 3.0; LE/MECH 3202 3.0

INSTRUCTOR(S)

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<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
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<td>Kempers, Roger</td>
<td>Sec. M / LECT / W</td>
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TOPICS AND CONCEPTS

- Introduction & Establishment of Course Expectation Course overview and schedule, Introduction to the scope of projects
- Engineering Design Problems in Industry Discussion about various design problems faced by the industry related to the mechanical engineering discipline and how they are related to the engineering sciences being learnt in various core courses.
- Development of technical skills to support Mechanical Engineering Design (materials selection, manufacturing techniques, introduction to simulation tools)
- Engineering Design Case 1: Thermofluids Potential case studies include: Thermal management for microelectronics, Heat engines, HVAC, Biomedical devices, 3D printing, etc.
- Engineering Design Case 2: Solid Mechanics and Dynamics Potential case studies include: Automotive/aircraft chassis design, Robotics and/or machinery for automatic or computer-integrated manufacturing, Prosthetic limb designs, Exoskeleton, Pressure vessels, Powertrains for motorsport, etc.
- Engineering Design Case 3: Advanced Energy Systems Potential case studies: Wind turbine, Thermoelectric generator, Solar Farm, Hydroelectric power generator, Fuel cells, etc. Exhibition Students will present their projects in the form of poster presentation to course instructors, classmates, other faculty members, and/or invited guests from industry.

LIST OF LEARNING OUTCOMES AND EXAMPLES OF

Course Learning Objectives

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

- Formulate engineering design problem(s) after learning about the needs demanded by
• targeted users and clients as well as the existing technology.
• Apply fundamental knowledge in natural science, mathematics, and/or engineering sciences to solve real-world engineering design problems with focuses in the mechanical engineering discipline.

Use computer modeling and simulation software and/or other engineering tools (e.g., laser cutter, lathe, milling machine, 3D printer, etc.) to model, simulate, and implement the design(s) to solve the defined engineering problems.
• Organize engineering design projects using project management techniques.
• Demonstrate the ability to seek and learn new material in addition to the class topics through the completion of an open-ended project.
• Demonstrate team work and communication skills by preparing project proposal, final report, and poster presentation.

GRADED ASSESSMENT

Proposed percentage breakdown for the course:
In-class/Tutorial Participation: 20%
Out-of-class Mini Design Project: 80%

ADDITIONAL INFORMATION

Required Textbook:
None

Recommended:
The following books are recommended as reference books to support students in the context of engineering design approach and process:
• A Resource for Students and Professionals in the Field of Product Design and Development http://www.ulrich-eppinger.net/

ACADEMIC INTEGRITY LINKS
• Senate Policy on Academic Honesty
• Academic Integrity

STUDENT LINKS
• Student Rights and Responsibilities
• Religious Observance
• Academic Accommodation for Students with Disabilities
• Counselling and Disability Services

Many courses utilize Moodle, York University's course website system. If your course is using Moodle, click here to access it.
Moodle @ York University