ME3MM3 Design II [10 credits]

Lecturers:  
Dr. Barry Aldwell (barry.aldwell@tcd.ie) (Course Coordinator)  
Dr. David McKeown (david.mckeown@tcd.ie)

Module organisation
Semester 1 & 2

<table>
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<tr>
<th>Start week</th>
<th>End week</th>
<th>Lecture hours per week</th>
<th>Lectures total</th>
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<tr>
<td>1</td>
<td>24</td>
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Module description, aims and contribution to programme
Building upon previously skills and knowledge developed in Manufacturing Engineering Design I (2MEMS10), students will progress from conceptual design to detailed engineering design. This module presents an integrated approach to mechanical system design. In addition to developing fundamental skills in mechanical design, students will also learn about the state-of-the-art in electronics and digital technology. The core element of the module focuses on a group based project. Students are tasked with working in groups towards the design and manufacture of a product of their own choosing, given a general theme such as a user group or application. Each group will be responsible for the development of their design from a concept through prototyping to a final design stage.

Learning outcomes
On successful completion of this module, students will (be able to):

1. Carry out detailed engineering design, to include the selection and use of standard components where appropriate.
2. Work as a productive member of a group, with an appreciation for the need for leadership and management.
3. Communicate their design through presentations, written reports, and engineering drawings.
4. Carry out a prototyping process to assess their designs for functionality, form, and fit, as appropriate.
5. Manufacture prototype components using additive manufacturing machines such as Ultimakers.
6. Program and use Arduino microcontrollers.
7. Give and receive appropriate feedback to and from their peers, and use this feedback to improve their designs.
8. Reflect upon their own performance and that of their group, and use this reflection to enhance their own learning.
9. Create manufacturing drawings for components, including manufacturing tolerances.
Module content
- Communication skills
- Reflection and feedback skills
- Microcontrollers and GUI (graphical user interface)
- Actuators and sensors
- Standard components (bearings, gears, springs, fasteners etc.)
- International standards
- Introduction to geometrical dimensioning and tolerancing
- Additive manufacturing for prototyping
- Group design project

Teaching strategies
The module is taught using a combination of lectures, laboratory demonstration and project feedback sessions at which teaching team members and/or teaching assistants interact with the project teams. The groups are also expected to undertake independent research and development work, with appropriate guidance and feedback, on the project. Elements of self assessment and peer assessment will be incorporated into the group assignment project.

Assessment
Continuous assessment (100%)

NB: As this course is 100% continuous assessment and involves substantial groupwork, supplemental examination will not be possible.

Required textbook
No prescribed texts – the library has a number of books on mechanical design, some of which will be mentioned in the lectures.

Further information
Course Blackboard - https://tcd.blackboard.com/