### Module Code
MEU22EM3

### Module Name
Design I

### ECTS Weighting
5 ECTS

### Semester taught
Semester 1

### Module Coordinator/s
Assistant Professor Conor McGinn (c.mcginn@tcd.ie)

### Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline

On successful completion of this module, students should be able to:

1. Perform ideation through techniques such as brainstorming, brainwriting, and the Delphi method.
2. Prepare a detailed design specification document.
3. Perform a systematic patent search and review.
4. To identify engineering standards that apply to a product or identify standards that might apply to a future prototype.
5. To develop and evaluate several design concepts to address a specific problem.
6. To evaluate the usability of a design concept.
7. To prepare a detailed embodiment design (including engineering drawings) using CAD.
8. To communicate their design through a presentation, and through the creation of technical documentation.

### Module description, aims and contribution to programme

The goal of the module is to teach students the fundamental skills of systematic Engineering design. It aims to introduce students to the systematic engineering design process (VDI 2221), and to help them gain familiarity with widely used methods and techniques for optimizing the design of mechanical systems. The module also introduces students to intellectual property, standardization, and data protection. The course is also intended to introduce students to research activities being undertaken within the School of Engineering. Where appropriate, assignments are inspired based on on-going research currently being conducted.

### Graduate Attributes: levels of attainment

To act responsibly - Introduced
To think independently - Introduced
To develop continuously - Introduced
To communicate effectively - Introduced

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1 TEP Glossary
Module Content

- Introduction to systematic design and VDI 2221 standard
- Conducting systematic ideation
- Intellectual property and standardisation
- Preparing product design specifications
- Conceptual design techniques
- Introduction to anthropometrics and ergonomics
- Evaluating design concepts and usability analysis
- Embodiment design
- Design for manufacture (DfM) and Design for Assembly (DfA)

Teaching and Learning Methods

The module is taught using a combination of lectures, practical sessions, and project feedback sessions at which teaching team members and/or teaching assistants interact with the project teams. For certain topics of the module, a flipped classroom strategy is used. Elements of self-assessment and peer assessment will be incorporated into assessment to support group-based learning outcomes.
### Assessment Details

Please include the following:

- **Assessment Component**
- **Assessment description**
- **Learning Outcome(s) addressed**
- **% of total**
- **Assessment due date**

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<th>Assessment Component</th>
<th>Assessment Description</th>
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<td>Product Design Specification Document</td>
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### Reassessment Requirements

1. An individual design project, carried out over the summer months.
2. Submission of a design document, detailing the application of systematic design principles to the individual design project.

### Contact Hours and Indicative Student Workload

**Contact hours: 33 Hours**

- **Independent Study (preparation for course and review of materials): 33**
- **Independent Study (preparation for assessment, incl. completion of assessment): 33**

### Recommended Reading List


Lecture notes are provided electronically, and recommended reading lists are given out where appropriate in advance of classes.

### Module Pre-requisite

na

### Module Co-requisite

2mems10

### Module Website

TCD Blackboard

### Module Approval Date

15-08-2019

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2 [TEP Guidelines on Workload and Assessment](#)
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<tr>
<th>Approved by</th>
<th>Dr. Garret O'Donnell</th>
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<tbody>
<tr>
<td>Academic Start Year</td>
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