

Module Code	ME5E3
Module Name	Innovation in Product Development
ECTS Weighting¹	15 ECTS - Derogation
Semester taught	Semester 1 & 2
Module Coordinator/s	Prof. Kevin Kelly, kevin.kelly@tcd.ie
Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline	<p>On successful completion of this module, students should be able to:</p> <ol style="list-style-type: none"> 1. Work in multidisciplinary teams on a technically ambitious and challenging project 2. Identify user needs and develop solution concepts to meet those needs 3. Analyse potential market and societal benefits of developed solutions 4. Conduct patent searches and analyse prior intellectual property 5. Liaise with professional engineers (and other staff in the commercial sector) in a professional and timely manner 6. Pitch design concepts at an advanced level, utilising prototypes and multi-media tools. 7. Management of time and budgets to deliver exacting requirements <p>Graduate Attributes: levels of attainment</p> <p>To act responsibly - Attained</p> <p>To think independently - Attained</p> <p>To develop continuously - Attained</p> <p>To communicate effectively - Attained</p>
Module Content	<p>5E3 is a project based module, where teams of students work, within a user-centred design framework, to conceptualize and manufacture a high quality prototype to real-world problem. Each team will work to a specific project brief from a project sponsor – typically a business with global scale. Project briefs will be significantly open-ended to facilitate truly innovative solutions to be developed. Students will work with an academic mentor/supervisor, teaching assistants and with a project liaison in the sponsor company. Projects will require liaison with project teams, in other universities, working on other aspects of the problem. Students will be expected to deliver a working prototype solution of commercial quality at</p>

¹ [TEP Glossary](#)

the conclusion of the project. Fully funded travel (2 or more trips) will be part of the module.

- Successful team formation and management
- Introduction to user-centred design
- Ideation and use of personas and POVs
- Embedded Microcontrollers for consumer products
- Human factors in engineering design
- Critical Experience and Critical Function Prototyping
- Dark Horse and 'Funky' prototyping
- Rapid prototyping and manufacturing
- Design for manufacture
- User testing
- Use of video/electronic media for communication
- Start-ups and entrepreneurship
- Intellectual Property

Teaching and Learning Methods

Learning will be predominantly self-directed, with significant guidance and supervision from staff and teaching assistants. Occasional lectures on topics of mutual benefit and interest will be organized. Students will follow a structured innovation paradigm, closely modelled on the Stanford ME310 curriculum.

Face to face interactions will be as required, limited and conforming to best practice as dictated by public health guidelines pertaining to Covid19

Assessment Details² Please include the following: <ul style="list-style-type: none"> • Assessment Component • Assessment description • Learning Outcome(s) addressed • % of total • Assessment due date 	Assessment Component	Assessment Description	LO Addressed	% of total	Week due
	Various	Many individual and group elements as outlined in the module handbook		100%	
Reassessment Requirements	N/A				
Contact Hours and Indicative Student Workload²	<p>Contact hours: The course is predominantly project based. Bespoke workshops, seminars and lectures are run on a number of occasions. There is approximately 1 hour per week of formal interaction with the teaching team. Informal and asynchronous (e.g. email, Slack) interactions will usually be a multiple of this</p> <p>Independent Study (preparation for course and review of materials):</p> <p>Independent Study (preparation for assessment, incl. completion of assessment): The module runs from September to June (i.e. beyond the end of the standard academic year. Students should expect to spend 15-20 hours per week on average over this period working on their project. Additionally, students may be required to travel to partner universities to engage in project work. Where such travel is required, costs will be covered.</p>				
Recommended Reading List					
Module Pre-requisite	4MEMS9 or 3B8				
Module Co-requisite	4MEMS9, if one of the above not already taken				
Module Website	https://www.tcd.ie/Engineering/Innovation/				
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.					
Module Approval Date					
Approved by					
Academic Start Year					

Academic Year of Date