Module Title: Engineering Research Project
Code: ME5E1 Mechanical Engineering Research Project
       ME5EM1 Engineering with Management Research project
Level: MAI (Mandatory module)
Credits: 25

Co-Ordinator(s): Professor Craig Meskell (cmeskell@tcd.ie)

Module Description
As part of the fulfilment of the final year module of the MAI, students in the Mechanical and Manufacturing Engineering stream are required to carry out an individual engineering project. To this end, each student is assigned a project topic and supervisor who will guide the course of the project throughout the academic year.

Note that 1-year visiting students are not eligible to take this module.

Learning Outcomes
Upon completion of the module students should be able to:
   a) Apply research methodology to an advanced topic in Mechanical and Manufacturing Engineering
   b) Determine the state of the art in the project topic from a detailed literature review and position his/her work in relative to the state of the art
   c) communicate effectively in technical and scientific writing, and to present scientific/technical ideas concisely to a technical audience that may not be expert in the specific domain of the presentation
   d) interface effectively with technical support staff where necessary
   e) identify and formulate technical problems in such a manner as to make them amenable to solution
   f) design a system, component or process to meet a specified goal
   g) analyse and interpret results from experiments/simulations conducted during the course of the project
   h) manage workflow and task scheduling within the constraints of resources and time given specific design goals and deadlines
   i) use industry standard hardware and/or software tools and codes of practice for all aspects of design including analysis and presentation;
   j) examine and discuss the impact of the project design or theme on the environment

Project Allocation
Once a list of projects to be offered in the coming year has been circulated, the projects allocated to students based on their stated preference and the order of merit in the Senior Sophister year. If necessary a second round of projects allocations may take place to ensure that every student is assigned a project.

While we endeavour to provide each student with a project of their choice, it is not possible to guarantee that a project in a particular field will be available.

The project allocation will be completed early in the first semester.
Assessment

There are three components to the assessment of this module:

- Interim Report (15%)
- Dissertation (70%)
- Oral communication of the project outcome (15%)

Students are required to present an interim project report at the project around the end of the first semester. This report will comprise a literature review, a clear statement of the objectives of the project, a report on the progress made to date and a work plan for completion. This report will be assessed by the supervisor.

Students are required to complete a dissertation based upon independent research conducted by the student under the supervision of a member of the academic staff. The dissertation should be approximately 20,000 words. Students will be provided with detailed guidance on writing the dissertation. This dissertation will be assessed by at least 2 members of staff, including the supervisor.

When all project work has been completed and the dissertation submitted students are required to present and defend their project to members of the academic staff. The students will be assessed on the presentation quality and style, technical understanding, progress and evidence of organisation and planning.