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| <b>Module Code</b>   | ME7B25   |
| <b>Module Name</b>   | Experimental and Research Methods in Engineering   |
| <b>ECTS Weighting</b>  | 10   |
| <b>Semester taught</b>   | Full Academic Year   |
| <b>Module Coordinator/s</b>  | Prof. Kevin O'Kelly  |
| <b>Module Learning Outcomes<br/>(with reference to the Graduate<br/>Attributes and how they are<br/>developed in discipline)</b> | <p>On completion of this module, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Evaluate the role of fundamental research in engineering, differentiate between the concepts of research, design and development in an engineering context</li> <li>2. Experience and employ different elements of the research process including project planning, investigating background literature, and conducting experiments, analysing results, documenting progress and ultimately reporting and presenting findings</li> <li>3. Clearly understand the ethical considerations of research including implications of plagiarism on their work</li> <li>4. Demonstrate an ability to engage in team-based research incorporating the latest cloud based collaborative tools</li> <li>5. Communicate the results of a research task to their peer group and analysis of the results in a discussion</li> <li>6. Assess their desire to engage in fundamental engineering research at graduate level or in industry</li> </ol> |
| <b>Module Content</b>  | <p>Students will conduct practical tasks representative of the process of engineering research over the course of this module. These tasks will involve the analysis of a physical experiment and a numerical research problem. The task will involve the design of a novel approach to solve a chosen research challenge.</p> <p>Students will work both individually and in teams representing a research group and with a division of tasks amongst the members.</p>  |
| <b>Teaching and Learning Methods</b>   | <p>There are no formal timetabled hours associated with the project but students are expected to dedicate the time necessary to make reasonable progress, and to keep in regular contact with their supervisor. It is recommended that students make a formal arrangement with their supervisors to meet on a weekly or fortnightly basis, preferably at a regular appointed time. Student timetables do facilitate free blocks which are very accommodating to the execution of the project. Project titles will be assigned in the second week of term which can be commenced immediately following this. There are ample durations between the first and second semester and during the summer semester during which research can be performed.</p>   |

## Assessment and Workload Details

| Assessment Component      | Assessment Description   | LO Addressed | % of Total | Week Due |
|---------------------------|--|--------------|------------|----------|
| Research Proposal         | Written research proposal to include extensive literature review and research plan to be submitted to Blackboard | 1-3, 13      | 50         | 10       |
| Interim Oral Presentation | Powerpoint Presentation  | 1-8, 13      | 50         | 33       |

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| <b>Reassessment</b> | There is no reassessment for the MSc |
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| <b>Contact Hours and Indicative Student Workload</b> | Contact hours: 1 hour/week/fortnight with supervisor<br>Independent Study (preparation for assessment, including completion of assessment): average of 5-10 hours/week |
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| <b>Recommended Reading List</b>  | Thiel DV. Research Methods for Engineers. Cambridge: Cambridge University Press; 2014.<br><br>Eng Choon Leong, Carmel Lee-Hsia Heah, Kenneth Keng Wee Ong, Guide to Research Projects for Engineering Students: Planning, Writing and Presenting 1st Edition, CRC Press, 2015<br><br>Journal articles and case studies related to research topic |
| <b>Module Website</b>  |  |
| <b>Other Schools/Departments involved in the deliver o this module</b> | Not applicable   |
| <b>Module Approval Date</b>  |  |
| <b>Approved by</b>   | Prof. Kevin O'Kelly  |
| <b>Academic Start Year</b>   |  |
| <b>Academic Year of Date</b>   |  |