Module Code
CEU44E03 (also 5E2/M5)

Module Name
Research Methods

ECTS Weighting
5 ECTS

Semester taught
Semester 1

Module Coordinator/s
Assistant Prof. Bidisha Ghosh (bghosh@tcd.ie)

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

Learning outcomes
On successful completion of this module, students will be able to:
1. Plan and manage a postgraduate research project
2. Critically appraise of existing research tools, methods and publications
3. Identify scope of future research and design a research proposal
4. Summarise, communicate (in written and oral form) research within and outside their own field
5. Recognise issues of plagiarism, confidentiality, data protection and other ethical issues
6. Design engineering experiments and analyse and interpret quantitative information collected
7. Identify and apply appropriate statistical software tool for experimental problem solving

Graduate Attributes: levels of attainment
To act responsibly - Attained
To think independently - Attained
To develop continuously - Attained
To communicate effectively - Enhanced
<table>
<thead>
<tr>
<th>Module Content</th>
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| Research Philosophies in Engineering, Research in Academia, Research scopes & problems, Research process and design, Characteristics of good research and choice of research topic.  
Components of research proposal, Literature review, Research strategies, Research ethics, Research access.  
Data collection, Data analysis, Sampling analysis, Software training, Report writing and Presentation.                                                                                   |                                                                                           |
| **Teaching and Learning Methods**                                                                                                                                                                                                 | Lectures & seminars given by lecturers, other academics and research experts  
Group/Individual learning of statistical software  
*(Lecture notes and presentation will all be available online in Blackboard)* |
Assessment Details

Please include the following:

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

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<thead>
<tr>
<th>Assessment Component</th>
<th>Assessment Description</th>
<th>LO Addressed</th>
<th>% of total</th>
<th>Week due</th>
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<tbody>
<tr>
<td>Ethics Approval Report</td>
<td></td>
<td>1,2,5</td>
<td>15</td>
<td>Week 1, Sem 2</td>
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<tr>
<td>Experimental Design</td>
<td></td>
<td>1,6,7</td>
<td>40</td>
<td>Week 1, Sem 2</td>
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<tr>
<td>Literature Review</td>
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<td>1-4</td>
<td>45</td>
<td>Week 4, Sem 2</td>
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Reassessment Requirements

Contact Hours and Indicative Student Workload

<table>
<thead>
<tr>
<th>Contact hours: 22hrs (2 hrs lecture per week)</th>
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<tr>
<td>Independent Study (preparation for course and review of materials): 50hrs</td>
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<tr>
<td>Independent Study (preparation for assessment, incl. completion of assessment): 50 hrs</td>
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Recommended Reading List


Module Pre-requisite

None

Module Co-requisite

None

Module Website

None

Are other Schools/Departments involved in the delivery of
this module? If yes, please provide details.

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<th>Module Approval Date</th>
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<tbody>
<tr>
<td>Approved by</td>
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<tr>
<td>Academic Start Year</td>
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<td>Academic Year of Date</td>
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