<table>
<thead>
<tr>
<th>Module Code</th>
<th>MEU44BM4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module Name</td>
<td>EXPERIMENTAL AND RESEARCH METHODS IN BIOMEDICAL ENGINEERING</td>
</tr>
<tr>
<td>ECTS Weighting</td>
<td>5 ECTS</td>
</tr>
<tr>
<td>Semester taught</td>
<td>Semester 1</td>
</tr>
<tr>
<td>Module Coordinator/s</td>
<td>Assoc. Prof. David Hoey</td>
</tr>
</tbody>
</table>

**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:

- **LO1.** Critically analyse current scientific/engineering topics and clearly and concisely present their findings in a literature review.
- **LO2.** Write high quality scientific reports and research proposals.
- **LO3.** Understand some of the more useful tools for data analysis.
- **LO4.** Understand the ethical issues involved in biomedical engineering.
- **LO5.** Be able to work on an engineering team to achieve.
- **LO6.** Utilise the scientific search engines to uncover relevant literature/patents/reports.
- **LO7.** Understand good practice in scientific/engineering experiments.

**Graduate Attributes: levels of attainment**

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

**Module Content**

This module’s goal is to educate students in the field of: biomechanical experimental practice, data analysis, scientific literature scrutiny and report writing. The course introduces students to a number of experimental data analysis tools, experimental methods, report writing skills, statistical tools, and good practice investigational methods when analysing engineering/scientific literature. There are 18 lectures on topics that will aid students to perform robust scientific experiments and write high-quality engineering/scientific reports.

- Lectures on report/literature review drafting skills
- Endnote, Pubmed and GraphPad workshops
- Virtual experimental sessions on the material properties of biological tissues
- An initiative lab – comprising the students setting up a new laboratory experiment
- Ethical issues in biomedical engineering

| Teaching and Learning Methods | The module is taught using a combination of on-line lectures, virtual laboratories and workshops. Due to COVID-19 restrictions all aspects of this course will be delivered on-line. |
### Assessment Details

Please include the following:

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

<table>
<thead>
<tr>
<th>Assessment Component</th>
<th>Assessment Description</th>
<th>LO Addressed</th>
<th>% of total</th>
<th>Week due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>Group literature review</td>
<td>LO1-7</td>
<td>30</td>
<td>8</td>
</tr>
<tr>
<td>Assignment</td>
<td>Individual research proposal</td>
<td>LO1-7</td>
<td>30</td>
<td>11</td>
</tr>
<tr>
<td>Lab report</td>
<td>Group lab report associated with a virtual bone testing lab</td>
<td>LO1-7</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Presentation</td>
<td>Group Presentation on the initiative challenge</td>
<td>LO1-7</td>
<td>20</td>
<td>14</td>
</tr>
</tbody>
</table>

### Reassessment Requirements

The course is reassessed via an assignment and an interview. The result of the interview will determine a weighting factor to be applied to a student’s examination grade.

### Contact Hours and Indicative Student Workload

- **Contact hours**: 44
- **Independent Study (preparation for course and review of materials)**: 18
- **Independent Study (preparation for assessment, incl. completion of assessment)**: 54

### Recommended Reading List

- Mind the Stop: A Brief Guide to Punctuation with a Note on Proof-correction by Gordon Vero Carey

### Module Pre-requisite

**MEU44BM5/ME5M19 Biomechanics**

### Module Co-requisite

No

### Module Website

No
<table>
<thead>
<tr>
<th><strong>Module Approval Date</strong></th>
<th>26/06/2020</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Approved by</strong></td>
<td>David Hoey</td>
</tr>
<tr>
<td><strong>Academic Start Year</strong></td>
<td>2020</td>
</tr>
<tr>
<td><strong>Academic Year of Date</strong></td>
<td>2020</td>
</tr>
</tbody>
</table>