4BIO4 Experimental and Research Methods in Biomechanics [5 Credits]

Lecturers: Bruce Murphy (Course Coordinator)  
David Hoey (Bone testing lab lecture/practical)  
Daniel Kelly (Cartilage Lab preparatory lecture)

Semester: 1

Module organisation
The module runs for semester 1 of the academic year. It is structured in two distinct phases, pre-reading week lectures and post reading week laboratory practical experiments. Total contact time is: 30 hours.

<table>
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<tr>
<th>Start week</th>
<th>End week</th>
<th>Lectures per week</th>
<th>Laboratory sessions</th>
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<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>3*</td>
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*3 lectures per week occur for the first 6 weeks of term

Module Description
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 3 practical elements to this course: a bone testing lab, a cartilage testing lab, and an initiative challenge of developing an experiment to mimic testing arterial tissue. There are 17 lecture on topics that will aid students to perform robust scientific experiments and write high-quality engineering/scientific reports.

Assessment
The course is assessed 100% by continuous assessment. There are 5 elements to this assessment:

1. An individual research proposal, due in week 4 (15%)
2. A group literature review, due at the end of reading week, (25%)
3. A group lab report associated with a bone testing lab, due in week 9 (20%)
4. A group presentation on an initiative challenge, due in week 12 (15%)
5. An individual cartilage lab report, due one week post the end of semester 1 (25%)

Methods used
Experimental image analysis  
Mechanical materials testing  
Matlab  
Statistical tools