Materials and Mechanics (MPHY0003)

**Description**
The purpose of this module is to provide students with general knowledge of statics, dynamics and materials such that they can apply it in a range of real life situations, with focus on the biomedical engineering applications. Upon completion of this module students should be able to:
1. Obtain free body diagrams of various systems;
2. Analyse forces in cantilever and simple supported beams and obtain sheer stress, bending moment and maximum bending moment;
3. Analyse simple structures using the method of the joints and the method of the sections and obtain the ground reactions and internal forces;
4. Describe material testing techniques, and analyse the stress versus strain curve;
5. Define and apply terminology and relationships related to 2nd moment of mass, 2nd moment of area and radius of gyration;
6. Compare different materials according to a wide range of properties, select a given material(s) for a specific application, and discuss the reasons and implications for their choice;
7. Describe different failure modes of materials;
8. Define and apply terminology and relationships related to Newton Laws, translational and rotational motion, work, energy, momentum and impulse;
9. Understand the principles and need of Finite Element Analysis, and analyse simple shapes with the relevant software;
10. Describe the use of the Instron ElectroPuls E3000 equipment, operate its software to set up customized static and dynamic tests, and analyse the results of various endurance and fatigue tests;
11. Apply knowledge of mechanics and materials to biomedical applications;

**Key information**

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<tr>
<th>Year</th>
<th>2019/20</th>
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<tbody>
<tr>
<td>Credit value</td>
<td>15 (150 study hours)</td>
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<tr>
<td>Delivery</td>
<td>UG L4, Campus-based</td>
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<td>Reading List</td>
<td><a href="#">View on UCL website</a></td>
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<tr>
<td>Tutor</td>
<td>Dr Pilar Garcia Souto</td>
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<td>Term</td>
<td>Term 2</td>
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<td>Timetable</td>
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**Assessment**

- Written examination (main exam period): 60%
- Coursework: 40%

**Find out more**

For more information about the department, programmes, relevant open days and to browse other modules, visit [ucl.ac.uk](http://ucl.ac.uk)

Disclaimer: All information correct as of August 2019. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.