**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**

- **Year**: 2020/21
- **Credit value**: 15 (150 study hours)
- **Delivery**: UG L4, Campus-based
- **Reading List**: View on UCL website
- **Tutor**: Dr Pilar Garcia Souto
- **Term**: Term 2
- **Timetable**: View on UCL website

**Assessment**

- Written examination (main exam period): 60.0%
- Oral Presentation: 22.0%
- : 6.0%
- : 6.0%
- Report: 6.0%

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