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;

Key information

- Year: 2018/19
- 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

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

Find out more

For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk

Disclaimer: All information correct as of December 2018. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.
11. Apply knowledge of mechanics and materials to biomedical applications;