1. **Title of the module**

EENG5160 (EL516) Biomechanics

1. **Division or partner institution which will be responsible for management of the module**

Computing, Engineering and Mathematical Sciences

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 5

1. **The number of credits and the ECTS value which the module represents**

15 credits (7.5 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn and Spring

1. **Prerequisite and co-requisite modules**

Pre-requisite: EL318 Engineering Mathematics

1. **The programmes of study to which the module contributes**

BEng Biomedical Engineering

BEng Biomedical Engineering with a Year in Industry

1. **The intended subject specific learning outcomes.  
   On successfully completing the module students will be able to:**

1. Demonstrate knowledge and understanding of the fundamental principles of statics and dynamics.

2. Demonstrate knowledge and understanding of the fundamental principles of machinery.

3. Describe a mechanical system using mathematical models.

4. Apply mechanics analysis for solving problems involving particles and rigid bodies.

5. Demonstrate familiarity with the applications of mechanics to biology and physiology

6. Solve engineering problems by reducing them to their parts and applying scientific analysis.

1. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**
2. Generate, analyse, present and interpret data.
3. Communicate more effectively in writing.
4. Learn effectively for the purpose of continuing professional development.
5. Think critically.
6. Manage their time and resources.
7. **A synopsis of the curriculum**

The aim of this module is to provide the students with the understanding of how the human body can be represented as a mechanical system and then analysed using principles of mechanics. For example the module explains how muscles and joints act as structures to provide equilibrium or generate movement. To achieve this, the module introduces firstly the concepts of statics, dynamics and mechanisms, and subsequently the module shows how these concepts can be applied to analyse the human body as a mechanical system.

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

* Engineering Mechanics: Statics and Mechanics – Costanza, Plesha and Gray, Mc Graw Hill, 2012,
* Meriam Engineering Mechanics: Statics SI Version, by J. L. Meriam ,‎ L. G. Kraige ,John Wiley & Sons; International student edition (8 Jan. 2008)
* Kinematics, Dynamics, and Design of Machinery, by Kenneth J. Waldron,‎ Gary L. Kinzel ,‎ Sunil K. Agrawal,Wiley-Blackwell; 3rd Edition (10 Jun. 2016)

1. **Learning and teaching methods**

Total contact hours: 38

Private study hours: 112

Total study hours: 150

1. **Assessment methods**
   1. Main assessment methods

* Exam 2 hours 75%
* Lab report 10% - typically 5 A4 pages
* Assignment 15%- typically 4 A4 pages

13.2 Reassessment methods

like-for-like

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 8.6 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Lectures | **x** | **x** | **x** | **x** | **x** |  |  |  | **x** | **x** |  |
| Lab classes | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Example classes | **x** | **x** | **x** | **x** | **x** | **x** |  |  |  | **x** |  |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |
| Exam | **x** | **x** | **x** | **x** | **x** | **x** |  |  | **x** | **x** |  |
| Lab reports | **x** |  | **x** |  | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Assignment | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** |  |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

Internationally recognised books are used to present the material presented in this course.

The module will use internationally developed and recognised notation and mathematics models for biomechanics.

**DIVISIONAL SUPPORT OFFICE USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 11/02/19 | Major | September 2019 | 3, 13 | No |
| 24/10/2022 | Minor | September 2023 | 5 | No |