UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Rehabilitation and Prosthetics
Module Code	MHT6019-B
Academic Year	2022/3
Credits	20
School	Department of Biomedical and Electronics Engineering
FHEQ Level	FHEQ Level 6

Contact Hours	
Type	Hours
Lectures	24
Seminars	6
Tutorials	3
Directed Study	167

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

Module Aims

An important module for those wishing to specialise in this area for the NHS.
The module aims:
- To provide an overview of common bone disorders, as well as musculoskeletal / neural disorders (e.g. stroke, spinal lesion, musculoskeletal deformities, etc.) and how/why such disorders occur. along with current treatment including assistive devices and various diagnostics.
- To develop in students a critical understanding of how lower-limb prosthetic devices are designed in order to replicate/mimic the function of the physiological limb, and the various methodological approaches used to evaluate a device's function/efficacy.

Outline Syllabus

The module will introduce key aspects of rehabilitation engineering, with a focus on lower-limb prosthetics, and provide an understanding of the need for professional and ethical conduct in rehabilitation engineering.
It will cover common musculoskeletal and neural disorders and how/why such disorders come about, including musculoskeletal classification, i.e. various types, symptoms, known causes. It will also cover diagnostics of such disorders, along with treatments such as use of assistive devices, genetic counselling, and known medication (modern and alternative medicine).
The module will also cover the design of clinically available lower-limb prosthetic devices including the concepts/approaches involved in such design; the mechanical/biomechanical functioning of such devices; and the assessment approaches used to evaluate the effectiveness of developments in such devices.

Learning Outcomes

Outcome Number	Description
LO1	Critically evaluate and discuss scientific journal articles related to evaluating the efficacy of developments in prosthetic design.
LO2	Understand the design of present-day lower limb prosthetic devices and their mechanical/biomechanical functioning; how design is influenced by health and safety issues of users (patients); and how the type (design) of device offered to a patient is often dictated by commercial and economic drivers;
LO3	Explain how orthotic devices are able to initiate, restore, or secure function of the musculosketal system.
LO4	Be conversant with how data regarding patient responses to using a prosthetic device can be analysed and interpreted to determine a device's efficacy as well inform developments in design.
LO5	Identify and describe common bone, muscular skeletal and/or neural disorders (e.g. due to stroke, spinal lesion, musculosketal deformities, etc.) and how/why such disorders occur.

Learning, Teaching and Assessment Strategy

Concepts are introduced using formal lectures and selected reading. Further and deeper understanding is disseminated during themed seminars and demonstrations. The breadth of rehabilitation engineering is highlighted via analysis and discussion of case studies.

An understanding of the concepts and principles of orthotic/prosthetic devices will be assessed via coursework consisting of i) critical write-up of a case study analysis (LO4), and ii) technical report (LO1,2,3,5).

This module satisfies the below Learning Outcomes as specified by the Accreditation of Higher Education Programmes: Third Edition (AHEP3) as published by The Engineering Council in-line with the UK Standard for Professional Engineering Competence (UK-SPEC). These outcomes specify six key areas of learning: Science and Mathematics (SM), Engineering Analysis (EA), Design (D), Economic, Legal, Social, Ethical and Environmental Context (EL), Engineering Practice (P) and Additional General Skills (G).
SM1b, SM2b, SM3b, EA2, D1, D2, D3b, EL4, P1, P2, P3, P4, G1, G2, G3b, SM1m, SM3m, EA3m, EA4m, D8m, EL1m, EL3m, P2m.
Further details of these learning outcomes can be found at: https://www.engc.org.uk/

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Coursework - Written	Case study analysis (2000 words)	50%
Summative	Coursework - Written	Technical report (2000 words)	50%
Formative	Self and Peer Assessment	Peer assessment of contributions to seminars	N/A

Reading List
To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html

Please note:
This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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