UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Clinical Biomechanics
Module Code	MHT7008-B
Academic Year	2021/2
Credits	20
School	Department of Biomedical and Electronics Engineering
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Lectures	12
Seminars	16
Tutorials	6
Laboratories	6
Directed Study	160

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

Module Aims

To stimulate an understanding of the concepts underlying clinical biomechanics, and promote an understanding of how the application of biomechanics can provide insights into balance and locomotive disorders and/or adaptations.

Outline Syllabus

Covers 3D and advanced gait and posture analyses; including using inverse dynamics modelling to determine joint moments and muscle powers. Emphasis on how such is used in a clinical context (e.g. for diagnosis, assessment of rehabilitation outcome, etc). Weekly round-table discussion is used to develop a critical understanding of the literature, on for example topics such as: - is knee osteoarthritis a biomechanical problem and can we use biomechanical variables for early detection; - what are the gait and balance deficits in individuals with neural disorders; - how does the foot deform during ground contact to attenuate the reaction forces from the ground, etc.?

Learning Outcomes	
Outcome Number	Description
01	Describe a range of common human movement disorders and adaptations
02	Critically evaluate and analyse biomechanical/human movement data
03	Review and critically evaluate the application of biomechanics in the clinical context
04	Apply various methods for analysing and quantifying human movement with focus on biomechanical modelling to determine joint forces and moments.
05	Apply biomechanical theory to gain insights into balance, locomotive disorders and/or movement adaptations..
06	Scientifically critique key research articles in the subject area.

Learning, Teaching and Assessment Strategy

Analyses approaches are introduced and understanding of such approaches is developed during tutorial classes and practical work. Directed reading of key research papers in the area are used to explore main concepts and round-table discussions of these papers challenge understanding. Formative feedback will occur informally during the weekly tutorials and round table discussions.

Coursework consisting of three elements: i) classed-based test will assess understanding of inverse dynamics calculations (LO's 4); ii) contribution to round-table discussions will assess critical thinking and understanding of key concepts and of the relevant literature (LO's 1,,3,6); and iii) written report will assess ability to analysis, present, and interpret data (LO's 2,5).

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).

SM1m, SM2m, SM3m, SM4m, SM5m, SM6m, EA2, EA3m, D1, D2, EL2, EL6m, P1, P4, P9m, G1, G3m.

Further details of these learning outcomes can be found at https://www.engc.org.uk/.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Attendance requirement	Tutor evaluation of contribution to weekly 'round table' discussion session of key research papers in the subject area	25%
Summative	Laboratory Report	Formal write-up of lab practical investigating the biomechanics of human locomotion (1600 Words)	40%
Summative	Classroom test	Joint kinetics calculations and interpretation	35%

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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