UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Mechanics of Materials
Module Code	BIC4017-A
Academic Year	2022/3
Credits	10
School	UoB International College
FHEQ Level	FHEQ Level 4

Contact Hours	
Type	Hours
Directed Study	50
Lectures	40
Laboratories	10

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Non-Standard Academic Year
BDA	University of Bradford / Semester 3

Module Aims

Describe the concepts of stress, strain, equilibrium and deformation, and apply them in the analysis and understanding of simple engineering frames and structures.

Outline Syllabus

* Forces: definition, resultant force, components of force, moment, equivalent force.
* Stress and strain: elastic modulus, shear force and bending moment.
* Structures: support reactions for statically determinate structures.
* Tension and compression: elastic behaviour of bar in tension/compression.
* Pin-jointed frames: external and internal forces.
* Bending moment and shear force diagrams: statically determinate beams subject to point and distributed loads.
* First and second moments of area: Bending stress due to bending moment.
* Beam deflections: Macaulay's method for integrating the expression for bending moment
* Sustainability: energy intensive production, waste products, reusability, UK and European standards

Learning Outcomes	
Outcome Number	Description
01	Apply concepts of equilibrium of forces, stress, strain, tension, compression, and bending to the analysis of simple engineering frames and structures.
02	Work independently to apply appropriate problem solving methods to both descriptive and quantitative challenges.
03	Record and interpret data, and communicate effectively.
04	Understand the impact of sustainability principles, durability and carbon footprint on the choice of materials.

Learning, Teaching and Assessment Strategy

Students are taught this course in a group of up to 18. Delivery is divided between tutor-led seminars which are classroom-based and focus on theory, and laboratory or workshop based sessions, where theory can be illustrated and tested through practical work. The teaching approach places considerable emphasis on interactivity between teacher and students and between individual students within the group. This is facilitated by the range of activities introduced into classes, the use of group and pair work, particularly in practical work, and of the further opportunities for interactivity provided.

Students are encouraged throughout to reflect on their own performance and skills development.
Within the practical element of the course students are able to learn about the laboratory/workshop environment and the importance of following appropriate rules and procedures so that everyone can work safely.

Student progress is closely monitored by both subject staff and each student's Personal Tutor. Tutors hold one to one sessions with students during which they are encouraged to reflect on their own progress in meeting their objectives which is particularly valuable in the context of this particular course. Out of this monitoring comes the provision, as necessary, of learner support in specific, identified weaker areas or where students are making limited, unsatisfactory progress.

In terms of summative assessment, lab reports are submitted after two practical sessions. At the end of the course students sit an unseen examination covering all aspects of the course.

The lab reports and final examination are spread through the term of study and supplemented by a range of shorter-term preparatory exercises. These do not contribute to the final course assessment but are marked and used to provide detailed feedback to assist the students to prepare for the lab reports and examination which contribute to the summative assessment.

During the course students are encouraged to reflect on their own progress in the theoretical and practical elements of their studies, and the level of formative assessment with which they are provided is intended to support them in this. It also gives the information required by tutors to provide the students with additional support in areas of weakness and to signpost them towards more challenging tasks in stronger areas.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Coursework - Written	Lab reports (2 x 500 words)	30%
Summative	Examination - Closed Book	Unseen Examination (2 Hrs)	70%

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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