



MODULE SPECIFICATION

| Part 1: Information | | | |
|---------------------------|--|--------------------|--|
| Module Title | Mechanisms and Structures | | |
| Module Code | UBLFQ9-30-1 | Level | Level 4 |
| For implementation from | 2020-21 | | |
| UWE Credit Rating | 30 | ECTS Credit Rating | 15 |
| Faculty | Faculty of Environment & Technology | Field | Architecture and the Built Environment |
| Department | FET Dept of Architecture & Built Environ | | |
| Module type: | Standard | | |
| Pre-requisites | None | | |
| Excluded Combinations | None | | |
| Co- requisites | None | | |
| Module Entry requirements | None | | |

| Part 2: Description |
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| <p>Educational Aims: See learning objectives.</p> <p>Outline Syllabus: This module is an introduction to mechanical engineering principles through applied mathematics, analytical reasoning, observation & physical prototyping.</p> <p>Introduction to Engineering.</p> <p>Design Engineering product case studies.</p> <p>Core Maths Skills.</p> <p>Force, Moment and Equilibrium.</p> <p>Mechanisms, Machines, work, energy and power, Springs and Pressure.</p> <p>Direct Stress & Strain, Shear Stress and Torsion, Cantilevers & Beams, Truss frames.</p> <p>The syllabus may also include some of the following topics:</p> |

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Friction, Electricity, Ergonomics, Graphical methods, Centre of gravity and balance, Buckling.

Teaching and Learning Methods: Teaching and Learning Strategy for this module is 'lectorial' based learning in which a topic lecture will introduce the students to the assigned or coming up exercises and/or project which supports and frames their acquisition of topic specific knowledge and skills.

The exercises and projects are designed to facilitate competency acquisition through the didactic and applied learning, building knowledge through the introduction of new subject matter and reinvestment of gained knowledge and skills. The tutorial portion (3 hours) of the studio is designed for the learner to have access to tutorial support, work in the close proximity of classmates and to self-assess his/her progress through the exercises and/or projects.

Exercise and Project work outside of scheduled hours is an essential component to the successful completion of the assigned work with an average time investment of 6+ hours per week. Students will be expected to come prepared for the module sessions with in-process or completed work and supplies.

At times though the run students will be required to pre-read on topics and selected materials, research and orally present on the topic.

Projects and course work is assessed through viva (oral presentations) "pinup" and project demonstrations in front of the students peers and tutors.

Feedback will be in the form of direct verbal and/or written. Marking criteria and assessment format will be clearly indicated on the Project Brief made accessible to the students at the beginning of each project.

Knowledge and Skills reinvestment from parallel running modules are assessable criteria and essential for progression through the curriculum.

Additional tutorial support is offered through individual appointments with the module tutors and through PAL.

Part 3: Assessment

The assessment strategy in this standard module is based upon evaluations of the process and the outcomes of the completed projects and a written exam.

Summative Assessment: Projects are evaluated on subject specific criteria clearly stated on each project brief at the outset of each project:

Projects are evaluated in both peer critiques (controlled condition evaluations) and direct submissions. These presentation critiques are held during term time and during the examination period. Typical presentations are 5 to 15 minutes in duration including the formal presentation and feedback from peers and tutors. (B)

Examination on design and analysis of mechanical structures (2 hours) (A)

An overall mark percentage of professionalism is allotted to assess aspects of participation and engagement (B)

Formative Assessment: Regular "in-process" critiques and one-to-one tutoring is given throughout the development process of the projects.

Feedback: Peer and tutor feedback is provided during the development process of the projects, during the project critiques.

| First Sit Components | Final Assessment | Element weighting | Description |
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| Project - Component B | | 38 % | Project 2: Structural Design and Analysis (42 Hours) |
| Project - Component B | | 37 % | Project 1: Kinetic Design and Analysis (42 Hours) |
| Examination (Online) - Component A | ✓ | 25 % | Online Examination (2 hours) |
| Resit Components | Final Assessment | Element weighting | Description |
| Project - Component B | | 75 % | Comprehensive project |
| Examination (Online) - Component A | ✓ | 25 % | Online Examination (2 hours) |

Part 4: Teaching and Learning Methods

| Learning Outcomes | On successful completion of this module students will achieve the following learning outcomes: | | | | | | | | | | | | | | | | | | | |
|---|--|--------------------------|--------------------------|--|-------------------------------------|--|---------------------------------------|---|--|---|-----------------------|---|------------------------------------|----|---|-----|------------------------------|-----|------------------------|-----|
| | <table border="1"> <thead> <tr> <th>Module Learning Outcomes</th> <th>Reference</th> </tr> </thead> <tbody> <tr> <td>Consideration and apply the appropriate mathematical and engineering principles to a particular design problem</td> <td>MO1</td> </tr> <tr> <td>Apply a systematic approach to problem solving using appropriate design tools and techniques</td> <td>MO2</td> </tr> <tr> <td>Evaluate technical risks and address risk in design methodology</td> <td>MO3</td> </tr> <tr> <td>Apply analytical skills in relation to designed objects including the ability to undertake visual analysis and to analyse designed objects in relation to their context</td> <td>MO4</td> </tr> <tr> <td>Apply creative and logical thinking processes as well as design methodologies to the creation of design solutions</td> <td>MO5</td> </tr> </tbody> </table> | Module Learning Outcomes | Reference | Consideration and apply the appropriate mathematical and engineering principles to a particular design problem | MO1 | Apply a systematic approach to problem solving using appropriate design tools and techniques | MO2 | Evaluate technical risks and address risk in design methodology | MO3 | Apply analytical skills in relation to designed objects including the ability to undertake visual analysis and to analyse designed objects in relation to their context | MO4 | Apply creative and logical thinking processes as well as design methodologies to the creation of design solutions | MO5 | | | | | | | |
| Module Learning Outcomes | Reference | | | | | | | | | | | | | | | | | | | |
| Consideration and apply the appropriate mathematical and engineering principles to a particular design problem | MO1 | | | | | | | | | | | | | | | | | | | |
| Apply a systematic approach to problem solving using appropriate design tools and techniques | MO2 | | | | | | | | | | | | | | | | | | | |
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| Apply analytical skills in relation to designed objects including the ability to undertake visual analysis and to analyse designed objects in relation to their context | MO4 | | | | | | | | | | | | | | | | | | | |
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| Contact Hours | <table border="1"> <thead> <tr> <th colspan="2">Independent Study Hours:</th> </tr> </thead> <tbody> <tr> <td>Independent study/self-guided study</td> <td>132</td> </tr> <tr> <td>Total Independent Study Hours:</td> <td>132</td> </tr> <tr> <th colspan="2">Scheduled Learning and Teaching Hours:</th> </tr> <tr> <td>Face-to-face learning</td> <td>96</td> </tr> <tr> <td>Project work (individual or group)</td> <td>72</td> </tr> <tr> <td>Total Scheduled Learning and Teaching Hours:</td> <td>168</td> </tr> <tr> <td>Hours to be allocated</td> <td>300</td> </tr> <tr> <td>Allocated Hours</td> <td>300</td> </tr> </tbody> </table> | | Independent Study Hours: | | Independent study/self-guided study | 132 | Total Independent Study Hours: | 132 | Scheduled Learning and Teaching Hours: | | Face-to-face learning | 96 | Project work (individual or group) | 72 | Total Scheduled Learning and Teaching Hours: | 168 | Hours to be allocated | 300 | Allocated Hours | 300 |
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| Allocated Hours | 300 | | | | | | | | | | | | | | | | | | | |

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| Reading List | <p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://uwe.rl.talis.com/modules/ublfq9-30-1.html</p> |
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Part 5: Contributes Towards

This module contributes towards the following programmes of study: