

## University of the West of Scotland

### Module Descriptor

Session: 2024/25

<b>Title of Module: Mechanics</b>			
<b>Code: MATH09010</b>	<b>SCQF Level: 9 (Scottish Credit and Qualifications Framework)</b>	<b>Credit Points: 20</b>	<b>ECTS: 5 (European Credit Transfer Scheme)</b>
<b>School:</b>	School of Computing, Engineering & Physical Sciences		
<b>Module Co-ordinator:</b>	Dr Alan Walker		
<b>Summary of Module</b>			
<p>This module introduces the field of mechanics.</p> <p>Concepts in kinematics, such as motion in a straight line, vectors and vector functions, trajectories and projectiles, forces, tension and reaction forces are discussed. Topics in dynamics, such as Newton's Law of Motion, Newton's Law of Gravity, equilibrium, tension, friction, moments and the centre of gravity are then introduced.</p> <p>The above topics are expanded upon with the introduction of Newtonian mechanics applied to particles, and particle-like objects. Topics shall include relative motion, motion under gravity, equilibrium and dynamics problems, uniform circular motion and energy, impulses and momentum.</p> <p>The module then considers the mechanics of rigid bodies. The mass and centre of mass of rigid bodies are introduced, together with the concepts of momentum of systems, total body forces, moments on a body, and linear and angular momentum. The equilibrium of rigid bodies is discussed, including gravitational forces, tension, contact points, couples and mountings.</p> <p>Finally, the motion of rods and laminae is considered. This includes angular velocity, the motion of circular discs, work and kinetic energy, angular momentum of laminae, moments of inertia, rotations of rigid bodies, and impulsive motion.</p> <p>The Graduate Attributes relevant to this module are given below:</p> <ul style="list-style-type: none"> <li>• Academic: Critical thinker; Analytical; Inquiring; Knowledgeable; Problem-solver; Autonomous.</li> <li>• Personal: Motivated; Resilient.</li> <li>• Professional: Ambitious; Driven.</li> </ul>			
<b>Module Delivery Method</b>			

Face-To-Face	Blended	Fully Online	HybridC	Hybrid 0	Work-Based Learning
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>See Guidance Note for details.</b>					

<b>Campus(es) for Module Delivery</b>						
The module will <b>normally</b> be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit) (tick as appropriate)						
Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Add name

<b>Term(s) for Module Delivery</b>					
(Provided viable student numbers permit).					
Term 1	<input type="checkbox"/>	Term 2	<input checked="" type="checkbox"/>	Term 3	<input type="checkbox"/>

<b>Learning Outcomes: (maximum of 5 statements)</b> These should take cognisance of the SCQF level descriptors and be at the appropriate level for the module. At the end of this module the student will be able to:	
L1	Apply a range of techniques in kinematics to stationary mechanics problems.
L2	Implement standard techniques for advanced mechanics problems involving motion.
L3	Apply a range of techniques to Newtonian mechanics problems involving particles and/or particle-like objects.
L4	Use a range of techniques to problems involving non-deformable bodies.
<b>Employability Skills and Personal Development Planning (PDP) Skills</b>	
SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	SCQF Level <b>9</b>  Demonstrating a detailed knowledge and understanding of important techniques necessary in the solution of mechanics problems.

	Demonstrating critical awareness of established techniques of enquiry in common applications in mechanics.	
Practice: Applied Knowledge and Understanding	<p>SCQF Level <b>9</b></p> <p>Using a range of standard techniques to solve problems at an advanced level, sometimes in non-routine contexts.</p> <p>Carrying out defined investigative problems within a mathematically based subject.</p>	
Generic Cognitive skills	<p>SCQF Level <b>9</b></p> <p>Conceptualising and analysing problems informed by professional and research issues.</p>	
Communication, ICT and Numeracy Skills	<p>SCQF Level <b>9</b></p> <p>Making formal written presentations based on the output from an investigative problem.</p>	
Autonomy, Accountability and Working with others	<p>SCQF Level <b>9</b></p> <p>Exercising independence and initiative in carrying out a range of activities.</p> <p>Identifying learning needs through reflection based on self, tutor and peer evaluation of work.</p>	
<b>Pre-requisites:</b>	Before undertaking this module the student should have undertaken the following:	
	<b>Module Code:</b> <b>MATH08008</b>	<b>Module Title:</b> Multivariable Calculus
	<b>Other:</b>	Or equivalent
<b>Co-requisites</b>	<b>Module Code:</b>	<b>Module Title:</b>

\*Indicates that module descriptor is not published.

<b>Learning and Teaching</b>	
<b>In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.</b>	
<p><b>Learning Activities</b></p> <p>During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:</p>	<p><b>Student Learning Hours</b> (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)</p>

Lecture/Core Content Delivery	24
Tutorial/Synchronous Support Activity	12
Independent Study	164
	Hours Total 200

**\*\*Indicative Resources: (eg. Core text, journals, internet access)**

The following materials form essential underpinning for the module content and ultimately for the learning outcomes:

“Mechanics” class notes as published on the University VLE.

“Mechanics”, W Chester

“Applied Mathematics”, ED Hodge and BGJ Wood.

Please ensure the list is kept short and current. Essential resources should be included, broader resources should be kept for module handbooks / Aula VLE.

Resources should be listed in Right Harvard referencing style or agreed professional body deviation and in alphabetical order.

(\*N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk\*) to wait until the start of session for confirmation of the most up-to-date material)

**Attendance and Engagement Requirements**

In line with the [Student Attendance and Engagement Procedure](#): Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.

**Equality and Diversity**

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: [UWS Equality, Diversity and Human Rights Code](#).

Please ensure any specific requirements are detailed in this section. Module Co-ordinators should consider the accessibility of their module for groups with protected characteristics..

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

**Supplemental Information**

<b>Divisional Programme Board</b>	Engineering and Physical Sciences
<b>Assessment Results (Pass/Fail)</b>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>School Assessment Board</b>	Computing, Engineering and Physical Sciences
<b>Moderator</b>	Dr Wan Mekwi
<b>External Examiner</b>	C Guiver
<b>Accreditation Details</b>	e.g. ACCA <a href="#">Click or tap here to enter text.</a>
<b>Changes/Version Number</b>	1.06 Module Coordinator Changed. Module Delivery Changed. Learning hours changed. Assessment Component Changed to Coursework.

<b>Assessment: (also refer to Assessment Outcomes Grids below)</b>
<p>This section should make transparent what assessment categories form part of this module (stating what % contributes to the final mark). Maximum of 3 main assessment categories can be identified (which may comprise smaller elements of assessment). <b>NB: The 30% aggregate regulation (Reg. 3.9) (40% for PG) for each main category must be taken into account. When using PSMD, if all assessments are recorded in the one box, only one assessment grid will show and the 30% (40% at PG) aggregate regulation will not stand. For the aggregate regulation to stand, each component of assessment must be captured in a separate box.</b> Please provide brief information about the overall approach to assessment that is taken within the module. In order to be flexible with assessment delivery, be brief, but do state assessment type (e.g. written assignment rather than “essay” / presentation, etc ) and keep the detail for the module handbook. <a href="#">Click or tap here to enter text.</a></p>
Assessment 1 - a series of short coursework assignments, 30% of the final mark
Assessment 2 – Adapted Assessment: 70% of the final mark
<p>(N.B. (i) <b>Assessment Outcomes Grids</b> for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed. (ii) An <b>indicative schedule</b> listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)</p>

**Assessment Outcome Grids (See Guidance Note)**

<b>Component 1</b>							
<b>Assessment Type (Footnote B.)</b>	<b>Learning Outcome (1)</b>	<b>Learning Outcome (2)</b>	<b>Learning Outcome (3)</b>	<b>Learning Outcome (4)</b>	<b>Learning Outcome (5)</b>	<b>Weighting (%) of Assessment Element</b>	<b>Timetabled Contact Hours</b>
Coursework	✓	✓	✓			30	0

<b>Component 2</b>							
<b>Assessment Type (Footnote B.)</b>	<b>Learning Outcome (1)</b>	<b>Learning Outcome (2)</b>	<b>Learning Outcome (3)</b>	<b>Learning Outcome (4)</b>	<b>Learning Outcome (5)</b>	<b>Weighting (%) of Assessment Element</b>	<b>Timetabled Contact Hours</b>
Adapted Assessment	✓	✓	✓	✓		70	2

<b>Component 3</b>							
<b>Assessment Type (Footnote B.)</b>	<b>Learning Outcome (1)</b>	<b>Learning Outcome (2)</b>	<b>Learning Outcome (3)</b>	<b>Learning Outcome (4)</b>	<b>Learning Outcome (5)</b>	<b>Weighting (%) of Assessment Element</b>	<b>Timetabled Contact Hours</b>
<b>Combined Total for All Components</b>						<b>100%</b>	<b>XX hours</b>

**Change Control:**

<b>What</b>	<b>When</b>	<b>Who</b>
Further guidance on aggregate regulation and application when completing template	16/01/2020	H McLean
Updated contact hours	14/09/21	H McLean
Updated Student Attendance and Engagement Procedure	19/10/2023	C Winter
Updated UWS Equality, Diversity and Human Rights Code	19/10/2023	C Winter
Guidance Note 23-24 provided	12/12/23	D Taylor
General housekeeping to text across sections.	12/12/23	D Taylor

Version Number: MD Template 1 (2023-24)