

University of the West of Scotland

Module Descriptor

Session: 2023/24

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Status: Proposal

Title of Module: Materials & Manufacture

Code: ENGG08001	SCQF Level: 8 (Scottish Credit and Qualifications Framework)	Credit Points: 20	ECTS: 10 (European Credit Transfer Scheme)
School:	School of Computing, Engineering and Physical Sciences		
Module Co-ordinator:	Asraf Uzzaman		

Summary of Module

The aim of this module is to provide an understanding in concepts of material science and engineering with reference to an essential element in mechanical design, materials and manufacturing process selection and the environment. Students will investigate a range of different types of modern materials. However, emphasis is placed on steel due to its importance in building, automotive and aerospace industry. An extensive laboratory exercise will be undertaken to determine how, through heat treatment the properties of steel can be modified. The importance of quality systems is demonstrated in relation to material conformity and manufacturing processes.

The module will be closely aligned to other Level 8 modules by utilising a real-world example that will be considered as a common theme across other Level 8 modules. The output from these modules will feed forward to further modules in Level 9. Thus, creating a holistic approach to learning within the programme.

During the course of this module students will develop their UWS Graduate Attributes. Academic Universal and Work-ready attributes: Students will gain knowledge and understanding of this important discipline as well as having the opportunity to develop a broad range of technical and transferable skills.

- This module has been reviewed and updated, taking cognisance of the University's Curriculum Framework principles. Examples of this are found within the module such as active and engaging practical testing laboratories, module assessment which reflects industry design activities, learning synergies across modules and levels of study, recorded lecture content supporting students to organise their own study time and the use of real-world practical student generated data.

Module Delivery Method

Face-To-Face	Blended	Fully Online	HybridC	HybridO	Work-based Learning
			✓		

Face-To-Face

Term used to describe the traditional classroom environment where the students and the lecturer meet synchronously in the same room for the whole provision.

Blended

A mode of delivery of a module or a programme that involves online and face-to-face delivery of learning, teaching and assessment activities, student support and feedback. A programme may be considered "blended" if it includes a combination of face-to-face, online and blended modules. If an online programme has any compulsory face-to-face and campus elements it must be described as blended with clearly articulated delivery information to manage student expectations

Fully Online

Instruction that is solely delivered by web-based or internet-based technologies. This term is used to describe the previously used terms distance learning and e learning.

HybridC

Online with mandatory face-to-face learning on Campus

HybridO

Online with optional face-to-face learning on Campus

Work-based Learning

Learning activities where the main location for the learning experience is in the workplace.

Campus(es) for Module DeliveryThe module will **normally** be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit)

Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
✓						

Term(s) for Module Delivery

(Provided viable student numbers permit).

Term 1	Term 2	Term 3
		✓

Learning Outcomes: (maximum of 5 statements)

On successful completion of this module the student will be able to:

L1. Apply a comprehensive knowledge of the structure of a variety of materials and explain how their properties may be varied through the addition of other materials or material processing.

L2. Use practical laboratory and workshop skills to investigate heat treatments, failure types and their mechanisms.

L3. Select and apply appropriate materials, engineering technologies and processes, recognising their limitations and the environmental and societal impact of solutions (including the entire life-cycle of a product or process) and minimise adverse impacts

L4. Discuss the role of quality management systems and continuous improvement associated with materials and manufacturing quality assurance and efficiency.

L5. Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used

Employability Skills and Personal Development Planning (PDP) Skills

SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	<p>SCQF Level 8.</p> <p>Demonstrate an extended knowledge of the different types and characteristics of engineering materials</p> <p>Demonstrate a knowledge of primary and secondary manufacturing processes</p> <p>Demonstrate a knowledge of appropriate tools used to to monitor and confirm quality assurance and efficiency.</p>
Practice: Applied Knowledge and Understanding	<p>SCQF Level 8.</p> <p>Select appropriate materials and manufacturing methods for a range of consumer products</p> <p>Determine the appropriate method of manufacture for an engineering component</p> <p>Analyse how tolerancing affects assembly and the role quality systems have on the assurance of correct assembly.</p> <p>Analyse the role quality systems have on material conformity.</p>

	Select and critically evaluate technical literature and other sources of information to solve complex problems
Generic Cognitive skills	SCQF Level 8. Use appropriate quantitative science and engineering tools to the analysis of basic engineering problems. Demonstrate the ability to monitor, interpret and apply the results of analysis and modeling
Communication, ICT and Numeracy Skills	SCQF Level 8. Demonstrate an understanding of the computer techniques available to enhance the communication of engineering ideas and concepts
Autonomy, Accountability and Working with others	SCQF Level 8. Develop an enhanced level of transferable skills that will be of value in working with others in more complex situations Recognise the role and contribution of team members when carrying out and evaluating tasks

Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code:	Module Title:
	Other:	
Co-requisites	Module Code:	Module Title:

* Indicates that module descriptor is not published.

Learning and Teaching	
The learning and teaching activity for this module includes, lectures, tutorials, examination and problem based learning.	
Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	Student Learning Hours (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture/Core Content Delivery	18
Tutorial/Synchronous Support Activity	17
Laboratory/Practical Demonstration/Workshop	1
Independent Study	164
	200 Hours Total

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

The following materials form essential underpinning for the module content and ultimately for the learning outcomes:
Essential resources:
Materials: Engineering Science Processing and Design by Michael Ashby et al, 4th Edition ISBN-13:978-0-08-102376-1 (2019)
Various handout materials

Callister's Materials Science and Engineering 10th Edition ISBN 978-1-119-45391-8

(*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)

Engagement Requirements

In line with the Academic Engagement Procedure, Students are defined as academically engaged if they are regularly engaged with timetabled teaching sessions, course-related learning resources including those in the Library and on the relevant learning platform, and complete assessments and submit these on time. Please refer to the Academic Engagement Procedure at the following link: [Academic engagement procedure](#)

Supplemental Information

Programme Board	Engineering
Assessment Results (Pass/Fail)	No
Subject Panel	Engineering
Moderator	Parag Vichare
External Examiner	P Lewis
Accreditation Details	This module is accredited by IMechE as part of BEng (Hons) Mechanical Engineering. and BEng (Hons) Aircraft Engineering programmes.
Changes/Version Number	<p>2.17</p> <p>Hybrid C Selected in lieu of Blended/Face-To-Face Learning Activities updated to reflect delivery. Assessment Changed to Unseen Closed Book Class Test from Unseen Open Book Examination. Laboratory Hours Updated to reflect delivery. Equality and Diversity Statement Updated.</p> <p>V2.16 LO's updated to reflect AHEP4 more accurately LO5 added to be included in coursework Assessment grid updated to reflect LO assessment method AHEP4 M4 included in Practice: Applied Knowledge and Understanding. Utilised in Assessments. v2.15 Module coordinator updated from Esther Smith to Asraf Uzzaman.</p> <p>V2.14 Module summary text updated to better reflect the module content and curriculum framework principles. Employability Skills and Personal Development Planning (PDP) Skills updated to reflect LO changes. Learning Outcomes updated to better reflect module content and to additionally reflect PSRB requirements. Learning and Teaching updated to reflect restructuring of module delivery involving greater focus on practical laboratory sessions. Accreditation details updated to reflect IMechE accreditation of BEng (Hons) Aircraft Engineering. Assessment grids updated to reflect LO4 inclusion in Component 2.</p> <p>Reference to 'unseen closed book examination' replaced with 'unseen open book examination' as per revised University policy. Change confirmed with accrediting body.</p> <p>v2.13 Summary of Module Updated to include to reflect environment influence on material selection. Assessment updated- Unseen closed book examination 60% and laboratory 40% with assessment outcome grids updated accordingly.</p> <p>V2.12 Module Coordinator changed to Esther Smith from TBC As a result of the Covid-19 situation, assessment component 1 changed from Unseen Closed Book to Unseen Open Book and Blended added as a Module Delivery Method.</p> <p>4. MC changed to TBC (Mech). 10. Assessment Grid, Component 2 was LO4 changed to LO3 16. Term 2 only was Term 1 and 2.</p> <p>2.07 The module summary has been changed to include the UWS attribute</p> <p>2.07 Module coordinator changed to Tabbi Wilberforce Awotwe Vers2.1 - Moderator updated</p> <p>Vers2.2 - accreditation details added Version 2.3 - removed Hamilton delivery</p> <p>Version 3- Module coordinator updated.COIL activity, quizzes and self-generated exams were added V3.1. weight of assignments were updated</p>

V3.2. COIL and self-generated activities were removed
Weight of assignment were updated

Assessment: (also refer to Assessment Outcomes Grids below)

Unseen Closed Book Class Test 60%

Laboratory 40%

(N.B. (i) **Assessment Outcomes Grids** 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 **indicative schedule** listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Handbook.)

Assessment Outcome Grids (Footnote A.)

Component 1

Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Class test (written)	✓	✓	✓	✓		60	2

Component 2

Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Laboratory/ Clinical/ Field notebook		✓			✓	40	1
Combined Total For All Components						100%	3 hours

Footnotes

A. Referred to within Assessment Section above

B. Identified in the Learning Outcome Section above

Note(s):

1. More than one assessment method can be used to assess individual learning outcomes.
2. Schools are responsible for determining student contact hours. Please refer to University Policy on contact hours (extract contained within section 10 of the Module Descriptor guidance note).
This will normally be variable across Schools, dependent on Programmes &/or Professional requirements.

Equality and Diversity

Aligned with the University's commitment to equality and diversity, this module supports equality of opportunity for students from all backgrounds and learning needs. Using the VLE, material will be presented electronically in formats that allow flexible access and manipulation of content. This module complies with University regulations and guidance on inclusive learning and teaching practice. Specialist assistive equipment, support provision and adjustment to assessment practice in accordance with the University's policies and regulations. More information on the University's EDI policies can be accessed at: <https://www.uws.ac.uk/about-uws/uws-commitments/equality-diversity-inclusion/>
UWS Equality and Diversity Policy

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