Module Descriptor

Title	Mechanical Design Group Project		
Session	2025/26	**Status**	Published
Code	ENGG10095	**SCQF Level**	10
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	T Leslie		

Summary of Module

Society continually requires mechanical design solutions for ever changing problems or opportunites. This module will provide students with the opportunity to assemble a variety of the learning from several of the modules previously undertaken and additional topics in a manageable group activity.

Working in small groups the students will analyse a design brief, determine a project plan, utilising an appropriate design process model throughout the activity will result in the preparation of conceptual and final designs and supporting detailed calculations.

Outcome 1 is intended to formualte and analyse complex mechanical design problems and arrive at robust conclusions.

Outcome 2 is intended to alllow students to demonstrate an integrated or systems approach to a complex problem.

Outcome 3 is intended to allow students to select and apply appropriate materails and processess in the fulfilment of a mechanical design.

Outcome 4 is intended to demonstrate holistic design solutions to societal problems.

Outcome 5 is intended to allow students to demonstrate their comunication skills when related to a mechanical design group task.

During the course of this module students will develop their UWS Graduate Attributes in the following areas

Universal: Academic - Critical thinking, analytical & inquiring mind; Personal- Emotionally Intelligent Ethical; Professional- Collaborative, Research Minded

Work-Ready: Academic - Knowledgeable, Digitally Literate, Problem Solver; Personal - Effective Communicator; Professional - Ambitious, Potential Leader

Successful : Academic - Autonomous, Innovative; Personal - Creative, Imaginative, Resilient; Professional- Driven

Module Delivery Method	On-Campus[1] ☒	Hybrid[2] ☐	Online[3] ☐	Work -Based Learning[4] ☐
Campuses for Module Delivery	☐ Ayr ☐ Dumfries	☐ Lanarkshire ☐ London ☒ Paisley	☐ Online / Distance Learning ☐ Other (specify)	

Terms for Module Delivery	Term 1	☒	Term 2	☐	Term 3	☐
Long-thin Delivery over more than one Term	Term 1 – Term 2	☐	Term 2 – Term 3	☐	Term 3 – Term 1	☐

Learning Outcomes	
L1	Formulate and analyse complex problems and reach substantiated conclusions.
L2	Apply an integrated or systems approach to the solution of complex problems.
L3	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.
L4	Design solutions for complex problems that evidence originality and meet a combination of societal, user, business and customer needs as appropriate.
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)	**SCQF 10** Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity

[1] Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

[2] The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

[3] Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

[4] Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

Practice: Applied Knowledge and Understanding	**SCQF 10** Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed
Generic Cognitive skills	**SCQF 10** Select and critically evaluate technical literature and other sources of information to solve complex problems Apply an integrated or systems approach to the solution of complex problems Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations
Communication, ICT and Numeracy Skills	**SCQF 10** Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed
Autonomy, Accountability and Working with Others	**SCQF 10** Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used

Prerequisites	**Module Code**	**Module Title**
	Other	
Co-requisites	**Module Code**	**Module Title**

Learning and Teaching
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.

The learning and teaching for this module will be delivered via a series of lectures and group discussions. The lectures will support content which is new/unfamilair to the students whilst group discussions will allow immediate and constructive formative feedback to be provided to the groups on their mechanical design project.

Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture / Core Content Delivery	12
Tutorial / Synchronous Support Activity	24
Independent Study	164
n/a	0
n/a	0
n/a	0
TOTAL	200

Indicative Resources

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

Access to Computer Aided Design (CAD) and Computer Aided Engineering software.

Childs P. R. N (1998) Mechanical design. London : Arnold.

Childs P. R. N (2019) Mechanical design engineering handbook. Oxford: Butterworth-Heinemann.

Dym, C. L., Little, P. (2000) Engineering design : a project-based introduction. Chichester : Wiley.

Hearn, E. J. (1996) Mechanics of Engineering Materials. Oxford: Butterworth.

Shigley, J. E., Mischke, C. R., Budynas, R. G. (2003) Mechanical engineering design. New York: McGraw-Hill Education.

(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.

For the purposes of this module, academic engagement equates to the following:

The School of Computing, Engineering and Physical Sciences considers attendance and engagement to mean a commitment to attending, and engaging in, timetabled sessions.

Students will scan their attendance, via the attendance scanners, each time they are on-

campus, they will have their attendance recorded in class and they will be expected to login to the VLE several times per week. Students who are unable to attend a timetabled session, due to illness or other circumstance, should notify their Programme Leader. Across the School an 80% attendance threshold is set. Students who fall below this, will be referred to the Student Success Team to see how they can be best supported in their studies.

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. 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. This module has laboratory-based teaching and as such you are advised to speak to the Module Co-ordinator to ensure that specialist assistive equipment, support provision and adjustment to assessment practice can be put in place, in accordance with the University's policies and regulations.
(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

Divisional Programme Board	**Engineering Physical Sciences**
Overall Assessment Results	☐ **Pass / Fail** ☒ **Graded**
Module Eligible for Compensation	☐ **Yes** ☒ **No** **If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.**
School Assessment Board	Design
Moderator	T Murmu
External Examiner	M Ghaleeh
Accreditation Details	This module is part of the IMechE accredited programmes BEng/Meng (Hons) Mechanical Engineering.
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	Original

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Written Coursework submission (70%)
Assessment 2

Presentation (30%)
Assessment 3
N/A
(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 Module Handbook.)

Component 1							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Written Coursework	☒	☒	☒	☒	☒	70	0

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Presentation	☒	☒	☒	☒	☒	30	1

Component 3							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
N/A	☐	☐	☐	☐	☐		
Combined total for all components						100%	1 hours

Change Control

What	**When**	**Who**