MODULE DESCRIPTION FORM

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

ME214 MECHANICAL ENGINEERING DESIGN 2

Module Registrar: Mr Jayson Cheyne jayson.cheyne@strath.ac.uk	**Taught To (Course): Cohorts for whom module is compulsory**		
Other Lecturers Involved: Dr Athanasios Toumpis	**Credit Weighting: 10 (ECTS 5)**	**Semester: 1 and 2**	
Assumed Prerequisites: ME105 or ME109 (BME students)	**Compulsory module**	**Academic Level: 2**	**Suitable for Exchange: N**

Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	**Total**
3		s1: 10 s2: 9						78	100

Educational Aim

This module aims to:

- Develop competency using the Solidworks software suite, building competencies and leading to certification to Industry Standard.
- Consolidate the understanding of the requirements, development, and adherence to International Standards with regards engineering drawings.
- Apply materials selection methodologies to compare and analyse the choice of materials in engineering design.

Learning Outcomes

On completion of the module the student is expected to be able to:

LO1. Have an increased depth of knowledge and skills in the use of the modern features-based 3D modeller.

LO2. Use a modern features-based 3D modeller to create assemblies.

LO3. Use materials selection methodologies and relevant software to make rational choices on the basis of engineering, considering manufacturing techniques and other parameters affecting the final costs of products.

Syllabus

The module will teach the following:

Advanced Modelling practises

- Development of a functional understanding of 3D modelling practises within the Solidworks platform.
- Understand the importance of, and adhere to, international standards for computer aided modelling.
- Creation of parts and assemblies within Solidworks.

Material selection for engineering design

- Understand the classifications and the terminology to describe materials and their properties.
- Utilise a design process for materials selection to identify, compare and analyse appropriate materials.
- Implement the stages of a materials selection design process in Granta EduPack software.

Assessment of Learning Outcomes

Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

LO1
C1 Develop a modelling strategy and Design Intent to create appropriate models suitable for utilisation in engineering drawings.
C2 Have sufficient functional knowledge of the programme as demonstrated with industry recognised certification.
C3 Demonstrate sound engineering judgement and effective communication skills.

LO2
C1 Develop a modelling strategy (highlighting assumptions) and select appropriate idealisations which are compatible with the objectives of the assembly being undertaken.
C2 Demonstrate sound engineering judgement and effective communication skills.

LO3
C1: Identify the material properties associated with specific mechanical or environmental conditions.
C2: Examine existing parts or interpret a design brief to relate material properties to prescribed operating conditions.
C3: Apply the stages of the material selection process for a new or existing part to reveal candidate materials.
C4: Use materials selection software to manipulate a library of materials, graphically analyse and communicate the material selection process.
C5: Analyse and contrast candidate material choices in a real world case study.
C6: Recommend materials for a design problem with additional consideration of processing, sustainability, and other parameters affecting final costs of products.

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

Principles of Assessment and Feedback
(within Assessment and Feedback Policy at: https://www.strath.ac.uk/professionalservices/staff/policies/academic/)

Advanced Modelling Practices:
This module works in a 'Lectorial' format, using short 'teaching' bursts interspersed with assisted lab based tutorials. This gives the students an opportunity to learn the software by working through weekly exercises and assignments with the support of experienced lab tutors. Students are encouraged to work in small groups to understand and solve basic engineering problems, allowing feedback both from other students and staff and the ability to learn from the mistakes and successes of others.

There are timetabled support sessions where students have ample opportunity for feedback on progression. Students can also ask for feedback between sessions on the class forums.

The significant laboratory content also provides students with the opportunity to develop and practice the required competences before summative assessment takes place. Feedback is available to students from staff in each lab session.

Students are encouraged to provide feedback to module staff through Myplace feedback forms. Additional support materials are developed throughout the module to improve students' understanding.

Staff involved in this subject reflect on the module delivery each year and share their own experiences with a view to updating the module and improvement of the student learning experience.

Materials Selection
This part of the module consists of lectures and tutorials. The scheduled tutorials are used to provide demonstrations of solving materials selection problems and hands-on experience of relevant materials selection software. They provide further opportunity for students to give and receive informal feedback and ask questions about lecture and tutorial contents.

Additional formative feedback is enabled and encouraged through students' participation in ungraded Myplace quizzes.

An online assessment is used to assess each student's learning of this module component. Formal feedback is given by way of the return of marks.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams *(individual weightings)*

Examination				Online assessment		Practical		Project	
Number	Month(s)	Duration	***Weighting***	Number	***Weighting***	Number	***Weighting***	Number	***Weighting***
1	Apr/May	3 hours	70%	Myplace quiz (s2 wk5)	30%				
* LO1, LO2				* LO3		*		*	

* ***L/Os:*** *Indicate which Learning Outcomes (L01, L02, etc) are to be assessed by exam/coursework/practical/project as required.*

Coursework / Submissions deadlines (*academic weeks*):

Myplace quiz - semester 2 week 5

Resit Assessment Procedures:
2hr examination in July/August diet.

PLEASE NOTE:
Students must gain a summative mark of 40% to pass the module. Students who fail the module at the first attempt will be re-assessed during the July/August exam diet. This re-assessment will consist entirely of examination. No marks from any previous attempts will be transferred to a new resit attempt.

Recommended Reading

*****Purchase recommended **Highly recommended reading *For reference**

** Materials Selection in Mechanical Design, 4th Ed, Michael Ashby, Butterworth-Heinemann, ISBN-10: 1856176630, 2010.
* Official Guide to Certified SOLIDWORKS Associate Exams: CSWA, CSWA-SD, CSWSA-FEA, CSWA-AM, SDC Publications, ISBN: 978-1-63057-232-7, 2018.

Additional Student Feedback

Date	Time	Room No
Weekly tutorial	TBC- class split between labs.	Check timetable webpages for details

Assessment of this class is by an Examination during the 2nd semester exam diet (70%) and through a Materials Selection quiz (30%).

Informal feedback will be given on the tutorial based assignment during lab time. Due to the nature of the certified examinations, specific feedback on questions will not be available however lecturing staff will discuss general results as far as is possible and be happy to provide discussion and feedback on the tests per any queries the students have.

Students will receive continuous formative feedback through the regular tutorial sessions and should make full use of these opportunities.

Session: 2025/26

Approved:

Programme Lead/Director Signature: Dr Andrew McLaren

Date of Last Modifications: 04 August 2025

(MAE template updated June 2025)

MODULE TIMETABLE

Module Code:	**ME214**	**Module Title:**	**Mechanical Engineering Design 2**

Brief Description of Assessment:

1 x semester 2 Certified SolidWorks Associate (CSWA) examination (April/May exam period)
1 x Myplace quiz on Materials Selection (Time-constrained quiz)

Assessment Timing

Indicated on the table below are the start/submission dates for each assignment/project and the timing of each exam/assessment.

Please note: Timings could change during unforeseen periods of disruption; this should only be used as a guide.

Semester One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.

Semester Two	C&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Online Test	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Exam