PROFESSIONAL PRACTICE - 2024/5

Module code: ENGM302

Module Overview

Engineering activity can have a significant societal impact and engineers must operate in a responsible and ethical manner, recognise the importance of diversity, and help ensure that the benefits of innovation and progress are shared equitably and do not compromise the natural environment or deplete natural resources to the detriment of future generations.

Module provider

Mechanical Engineering Sciences

Module Leader

FOREMAN Charlotte (Mech Eng Sci)

Number of Credits: 15

ECTS Credits: 7.5

Framework: FHEQ Level 7

Module cap (Maximum number of students): N/A

Overall student workload

Workshop Hours: 8

Independent Learning Hours: 106

Lecture Hours: 8

Seminar Hours: 9

Guided Learning: 11

Captured Content: 8

Module Availability

Semester 2

Prerequisites / Co-requisites

n/a

Module content

Indicative content includes: Project and risk management, Errors and Uncertainties, Commercialisation of Research Results, Ethics for Engineers, Data management, Security, Open Research, Equality, diversity and inclusion in engineering practice and design, Personality types & communication preferences, Professional behaviour, Sustainability in complex problems

Assessment pattern

Assessment type	Unit of assessment	Weighting
Online Scheduled Summative Class Test	Sustainability test	Pass/Fail
Online Scheduled Summative Class Test	EDI test	Pass/Fail
Coursework	Executive Summary	20
Project (Group/Individual/Dissertation)	Poster submission, elevator pitch and group working	80

Alternative Assessment

N/A

Assessment Strategy

The assessment strategy is designed to enable students to build a portfolio of solutions to engineering problems relating to a range of themes.

Thus, the summative assessment for this module consists of:

Sustainability & EDI Quiz: LO's: 1 & 4

Poster & Video product launch pitch (including group working assessment score): L0's 1-5

Executive summary: L0's 1-5

Formative assessment - Verbal feedback will be provided in workshops and seminars.

Module aims

- To equip the participants with skills set to operate effectively in a modern engineering context characterised by complex multifaceted problems involving multiple and diverse stakeholders.

Learning outcomes

		Attributes Developed	
Ref			
001	Evaluate the sustainability (environmental, societal and economic impacts) of solutions to complex problems	CT	M7,M8

Ref		Attributes Developed	
002	Apply appropriate risk management processes to manage risks and uncertainty	P	M9, M14, M15
003	Adopt appropriate methods to ensure security risks are managed	P	M10
004	Employ approaches that address inclusiveness in engineering practice and design	PT	M11, M17
005	Operate in a professional capacity recognising the needs and behaviours of others	P	M12, M16, M18

Attributes Developed

C - Cognitive/analytical

K - Subject knowledge

T - Transferable skills

P - Professional/Practical skills

Methods of Teaching / Learning

The learning and teaching strategy is designed to develop an appreciation of non-technical challenges and barriers for practicing engineers and research scientists. The teaching strategy is designed to encourage active dialogue between students, lecturers and Industry representatives.

The teaching methods require students to draw on a number of case studies, with the students exploring the core engineer attributes through a mix of lectures, self-paced work and active discussion.

Indicated Lecture Hours (which may also include seminars, tutorials, workshops and other contact time) are approximate and may include in-class tests where one or more of these are an assessment on the module. In-class tests are scheduled/organised separately to taught content and will be published on to student personal timetables, where they apply to taken modules, as soon as they are finalised by central administration. This will usually be after the initial publication of the teaching timetable for the relevant semester.

Reading list

https://readinglists.surrey.ac.uk
Upon accessing the reading list, please search for the module using the module code: ENGM302

Other information

The School of Mechanical Engineering Sciences is committed to developing graduates with strengths in Employability, Digital Capabilities, Global and Cultural Capabilities, Sustainability, and Resourcefulness and Resilience. This module is designed to allow students to develop knowledge, skills, and capabilities in the following areas:

Digital capabilities: Students will be required to use a variety of software packages in order to solve the engineering problem case studies, such as using excel to create worksheets for calculations, using Teams to work effectively and share resources within their group tasks and using software tools to present their business case in the form of a poster presentation.

Employability: The fundamental principle for this module is to prepare students for entering the engineering sector by developing their knowledge and critical thinking skills in key themes that are the requirements for a professional engineer such as risk, sustainability, ethics and EDI. Students are also required to develop their knowledge in IP, participate in a technology readiness

assessment and also produce a business case, all skills engineering employers would hope to see developed in current graduates. Transferable skills including communication, team work and presentation skills will be improved through module activities.

Sustainability: Students will take part in a seminar on sustainability in relation to engineering. The students will work together in a group to solve a case study relating to sustainability and the circular economy, including material recycling.

Global and Cultural capabilities: Students will work in randomly assigned groups. This will require students to engage effectively with people from different backgrounds in ways that respect the interests of cultural groups. Invited industrial speakers will demonstrate how their specific company is responding to equality and diversity requirements within an engineering context. Students will be exposed to a variety texts to review within the module and case studies that have been chosen are from a range of different countries. Students will have to engage with a range of information sources in relation to the responsibilities of a Professional Engineer, some which may challenge their own values and this will encourage them to be open to adapt their own viewpoint.

Resourcefulness and resilience: Through participation in the group seminars, students will actively engage in group working which will emphasise the importance of team cohesion, respect, empathy and build trust with other learners. This will provide opportunities to positively respond to team setbacks.

Programmes this module appears in

Programme	Semester	Classification	Qualifying conditions
Aerospace Engineering MEng	2	Compulsory	A weighted aggregate mark of 50% is required to pass the module
Automotive Engineering MEng	2	Compulsory	A weighted aggregate mark of 50% is required to pass the module
Biomedical Engineering MEng	2	Compulsory	A weighted aggregate mark of 50% is required to pass the module
Mechanical Engineering MEng	2	Compulsory	A weighted aggregate mark of 50% is required to pass the module