

## MODULE DESCRIPTION FORM

### DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

## ME310 PROFESSIONAL RESPONSIBILITIES

|  |  |                   |                          |
|--|--|-------------------|--------------------------|
| Module Registrar: Dr R Minty<br><a href="mailto:ross.f.minty@strath.ac.uk">ross.f.minty@strath.ac.uk</a> | Taught To (Course): All third-year undergraduate degree courses delivered by MAE |                   |                          |
| Other Lecturers Involved: Prof D Mackenzie   | Credit Weighting: 10 (ECTS 5)  | Semester: 2       |                          |
| Assumed Prerequisites: None  | Compulsory / optional class  | Academic Level: 3 | Suitable for Exchange: Y |

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

| Lecture | Tutorial | Laboratory | Groupwork | External | Online | Project | Assignments | Private Study | Total |
|---------|----------|------------|-----------|----------|--------|---------|-------------|---------------|-------|
| 10      | 10       |            | 40        |          |        |         | 30          | 10            | 100   |

#### Educational Aim

This class aims to create awareness of and develop skills expected in graduate professional engineers. These include the development of communication skills (both oral and written), societal impact, future trends, and ethics. As a significant part of a professional engineer's responsibilities involves ethics, this forms a large part of the class.

The study of engineering ethics within an engineering course helps students prepare for their professional lives. A specific advantage for engineering students who learn about ethics is that they develop clarity in their understanding and thoughts about ethical issues and the practice in which they arise. The study of ethics helps students to develop widely applicable skills in communication, reasoning, and reflection, with an understanding of the importance and benefits of supporting equality, diversity, and inclusion. These skills enhance students' abilities and help them engage with other aspects of the engineering programme such as group work and work placements.

#### Learning Outcomes

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

- LO1 Identify and develop skills that are required of a professional, accredited engineer by self- and peer-evaluation
- LO2 Explain the societal impact and professional responsibility of an engineer
- LO3 Examine case studies in engineering ethics using engineering principles
- LO4 Develop a professional ethical identity to carry forward in their working life

#### Syllabus

The module will teach the following:

- The benefits and importance of inclusivity from equality, diversity, and inclusion.
- Communication skills: written and oral. Group working skills.
- Societal and contemporary issues in engineering
- Professional conduct, ethics, and the legal aspects of professional responsibility.

A Case Study approach, using interactive group sessions is adopted (groups will be allocated at random utilising Myplace). The syllabus broadly covers awareness of issues, obligations and responsibilities. It will sensitise students to societal and ethical issues, resolving practical problems as well as enable students to identify questionable practice and ethical issues. Additionally, students will be given opportunity to enhance their ability to examine and weigh up opposing arguments, reflect upon and provide critique ethical issues, and provide consolidation of ethics skills and

practice. The primary outcome of the module will be to have introduced the students to the ethical issues and responsibilities of being a professional engineer.

### 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 Identify and practice skills that are required of a professional, accredited engineer by self- and peer-evaluation

C1 Demonstrates an awareness of what it means for engineering to be an accredited profession

C2 Identifies shortcomings in engineering skills through self-reflection and peer-evaluation

LO2 Explain the societal impact and professional responsibility of an engineer

C1 Identifies engineering decisions that have led to societal change

C2 Understands the relationship between technological innovation, societal impact, and professional responsibility

LO3 Examine case studies in engineering ethics using engineering principles

C1 Explain engineering decisions and principles within the case study source material

C2 Identify prior learning to investigate the effectiveness of engineering methods and/or decisions

C3 Propose solutions, where relevant, from problems arising from questionable practice

LO4 Develop a professional ethical identity to carry forward in their working life

C1 Understands that professional ethical identity requires a holistic view of societal progress

C2 Recognises and implements improvements that can be made to current personal working practices

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/>)

The assessment and feedback of the class is based on two group assignments:

1. A group report is written on a current topic of societal interest for example: continued extraction of fossil fuels, the role of nuclear power, ethical use of artificial intelligence and the role of electrical road vehicles in future transport (LO2/LO3/LO4). The group report is assessed anonymously by another group (LO1) and then the tutor assesses the performance of the evaluating group according to rigorous guidelines (specified beforehand). Each original group can see the assessment by their peer group as feedback and request additional information as required.
2. An interactive group session on a Case Study in Engineering Ethics. Case Studies are (usually) real examples of the various ethical issues that can occur in engineering (mostly taken from the various online databases of ethical cases). During the session, the case study will be released and initially introduced by the tutor. The groups required to write a short summary of the ethical issues, followed by a short presentation of the issues involved, which includes their own take on the case (LO1/LO2/LO3). Discussion is initiated by other groups after each presentation (LO4). Groups will be assigned to attend only one Interactive session to ensure parity.

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

| Examination |          |          |           | Coursework |           | Practical |           | Project |           |
|-------------|----------|----------|-----------|------------|-----------|-----------|-----------|---------|-----------|
| Number      | Month(s) | Duration | Weighting | Number     | Weighting | Number    | Weighting | Number  | Weighting |
|             |          |          |           | 2          | 50% each  |           |           |         |           |
|             |          |          |           | *LO1 – LO4 |           |           |           |         |           |

\* **L/Os:** Indicate which Learning Outcomes (LO1, LO2, etc) are to be assessed by exam/coursework/practical/project as required.

#### Coursework / Submission deadlines (*academic weeks*):

Group report submission in week 6

Group Interactive Session (including presentation) in weeks 9, 10, or 11.

#### Resit Assessment Procedures:

Submission of alternate <sup>^</sup>coursework prior to commencement of the August exam diet.

**^^Students must contact the module Registrar for details as soon as results confirm that a resit is required.**

**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 prior to the August diet. This re-assessment will consist entirely of a coursework. No marks from any previous attempts will be transferred to a new resit attempt.**

**Recommended Reading**

Engineering Ethics: Maintaining Society's Trust in the Engineering Profession, Royal Academy of Engineering Report, February 2022

Ethics in the Engineering Profession, Royal Academy of Engineering Report, June 2023

Code of Conduct Regulations, Institute of Mechanical Engineers (IMechE), 2021

Rules of Conduct, The Institute of Engineering and Technology (IET), October 2019

Global Sustainable Development Report (GSDR), United Nations, 2023

A World Built on Standards - A Textbook for Higher Education, Signe Annette Bøgh, Danish Standard Foundation, 2015

ISO in brief, International Organization for Standardization, 2019

**Additional Student Feedback**

*(Please specify details of when additional feedback will be provided)*

| Date | Time | Room No |
|------|------|---------|
|      |      |         |

Session: 2024/25

**Approved:**

**Course Lead/Director Signature: Dr Andrew McLaren**

**Date of Last Modifications: 30.08.2024**

## MODULE TIMETABLE

Module Code:

ME310

Module Title:

Professional Responsibilities

### Brief Description of Assessment:

Assignment 1: Group report on a contemporary topic in engineering (Coursework)

Assignment 2: Interactive group session & presentation on a Case Study in Engineering Ethics (1x Presentation per group)

### Assessment Timing

Indicated on the table below are the start/submission dates for each assignment/project and the timing of each exam/assessment. Dropdowns may be left blank. Add extra notes below the dropdowns where relevant.

**Please note: Timings can and will change, 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.<br>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.<br>Choose an item. | Choose an item.<br>Choose an item. | Choose an item.<br>Choose an item. | Course work Set | Choose an item.<br>Choose an item. | Choose an item.<br>Choose an item. | Course work Submit | Choose an item.<br>Choose an item. | Choose an item.<br>Choose an item. | Present ation | Present ation | Present ation | Choose an item. |