Engineering Tripos Part IIB, 4E17: Managing Engineering risks in real life, 2026-27

Leader

Professor T Minshall [1]

Timing and Structure

Lent term. 100% exam

Aims

The aims of the course are to:

- To provide students with a working knowledge of a selection of the key tools and techniques that will help them deploy their technical engineering skills to a maximum positive e:ect in diverse real-world contexts.
- To ensure students are aware of their own professional responsibilities, and consequences of their actions, when working as engineers in diverse real-world contexts, the formal and informal mechanisms of support available to them throughout their career.

Objectives

As specific objectives, by the end of the course students should be able to:

- Evaluate the environment and societal impact of solutions to complex problems (to include the entire lifecycle 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.
- Use a risk management process to identify, evaluate and mitigate risks (the e:ects of uncertainty) associated with a particular project or activity.
- Adopt an inclusive approach to engineering practice and recognise the responsibilities, bene?ts and importance of supporting equality, diversity and inclusion.
- Discuss the role of quality management systems and continuous improvement in the context of complex problems.
- Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.

Content

The module content has four elements spanning 8*2-hour lectures and self-study:

1. **Lectures** (faculty and guest speakers) to deliver core assessable content (see illustrative timetable).
2. Small group **discussions** of examples.
3. Through-module **case studies** providing each student with weekly tasks for (i) re?ecting upon and capturing key learning outcomes from each week’s content, and

(ii) providing material to support exam preparation.

Weekly short **reading** tasks to prepare for lectures and discussions.

	Week 1:	**Week 2:**	**Week 3:**	**Week 4:**	**Week 5:**
Part 1	Module introduction – why engineering IRL is so much harder than you might expect – and how you can reduce the risks of failure	What is the di=erence between risk and uncertainty? What tools exist for identifying & managing risks?	Introduction to product and process life cycles and scopes of impact	What do we mean by 'ethical concerns' and 'ethical choices'?	Why shoul about EDI? de?nitely n compliance
Part 2	How to manage any project to minimis risk of failure - introduction to basic project management tools	Application of tools and techniques to real world cases - does using them really make a difference?	Application of product life cycle and scopes of impact	Structured discussion and debate of example ethical concerns and choices, and what this means in the context of different organisations	How (not) t inclusive pr system. Di worked exa including h recruit & su in your tea
Example case studies	HS2 vs. IDP, CU tranformation vs LOR examples	Clinical School / JLR cyber attacks, Grenfell and Aberfan disasters, Covid-19	iPhone, lead additives in petrol, single use medical devices	Elon Must, societal impacts of AI, fast fashion	'Racist soa crash test d badly traine
Examples supporting materials	https://www.ap [2] m.org.uk/ and Business Model Canvas	National Cyber Security Centre national / corporate risk registers	Tools for assessing scope 1, 2 and 3 carbon emissions, PLC tools	PEI/RAEng on-line resources	RAEng res for building inclusive engineering startups

Booklists

Please refer to the Booklist for Part IIB Courses for references to this module, this can be found on the associated Moodle course.

Examination Guidelines

Please refer to Form & conduct of the examinations [3].

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Links
[1] mailto:thwm100@cam.ac.uk
[2] https://www.ap
[3] https://teaching26-27.eng.cam.ac.uk/content/form-conduct-examinations