Engineering Tripos Part IIB, 4E4: Management of Technology, 2017-18

Leader

Dr T Minshall [1]

Lecturers

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Timing and Structure

Michaelmas term. Eight 2-hour sessions incorporating industry speakers. Assessment: 100% coursework

Aims

The aims of the course are to:

- provide students with an understanding of the ways in which technology is brought to market by focusing on key technology management topics from the standpoint of an established business as well as new entrepreneurial ventures.
- place emphasis on frameworks and methods that are both theoretically sound and practically useful.
- provide students with both an understanding of the issues and the practical means of dealing with them in an engineering context.

Objectives

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

- have a thorough appreciation of how technology is brought to address market opportunities, and how technology management supports that process.
- assess and utilise appropriate technology management methods in different contexts.
- understand the core issues of technology management and the practical means of dealing with them in an engineering context.

Content

Introduction: Technology in the business context

- Technology origins and evolution.
- How technology generates value.
- What are technology management processes and how are they used?

Developing new technologies: Managing research and development (R&D) and intellectual property rights (IPR)

- How do you manage a portfolio of R&D projects?
- What are the key aspects of IPR, and how are they managed?
- How do you put a value on R&D projects and IPR?

Making money from new technologies: How to choose the right business model

- What are the different ways in which an idea can be brought to market?
- Why do most innovations reach the market through new firms rather than established firms?
- How do new and established firms work together?

Resources to bring ideas to market: 'Make versus Buy' (MvB) and strategic alliances

- Strategic context for MvB and partnering decisions.
- Tools and techniques to support MvB decisions.
- Working in partnership with other organisations.

New product introduction (NPI)

- Structuring the NPI process.
- New product life cycles, time-to-market and metrics.
- Completing an NPI project on time and within budget.

Open approaches to innovation

- Why open approaches have become very common
- What are the different types of open innovation?
- What are the challenges in managing open models of innovation?

Planning for the future: Technology strategy and planning

- Strategic technology management.
- Planning for the future by linking technology, product and market considerations - Technology Roadmapping (TRM).
- Scenario planning tools to help manage the uncertainties of the future.

Technology management in practice

- A panel of experienced technology managers will share lessons, and respond to queries posed by students.

REFERENCES

Additional resources for this module will be available from Camtools. Details will be given at the start of the module.

Coursework

For the coursework, students are required to research and write a report of approximately 3,000 words on a specific management of technology theme provided in the first lecture of the module. The report should draw upon module material supplemented with students' own research on both industrial practice & academic theory.

Coursework	Format	Due date & marks
Final report Coursework 1 brief description <u>Learning objective:</u> • Demonstrate understanding of the core Technology Management concepts delivered during the module;	Individual Report Anonymously marked	Friday 19th J 12:00 (noon) 100% of asse module

Coursework	Format	Due date & marks
• Demonstrate awareness of Technology Management concepts applied within different contexts; • Demonstrate competence at producing a Masters level academic report.		

Booklists

Please see the Booklist for Group E Courses [2] for references for this module.

Examination Guidelines

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

UK-SPEC

This syllabus contributes to the following areas of the UK-SPEC [4] standard:

Toggle display of UK-SPEC areas.

GT1

Develop transferable skills that will be of value in a wide range of situations. These are exemplified by the Qualifications and Curriculum Authority Higher Level Key Skills and include problem solving, communication, and working with others, as well as the effective use of general IT facilities and information retrieval skills. They also include planning self-learning and improving performance, as the foundation for lifelong learning/CPD.

IA1

Apply appropriate quantitative science and engineering tools to the analysis of problems.

IA2

Demonstrate creative and innovative ability in the synthesis of solutions and in formulating designs.

KU1

Demonstrate knowledge and understanding of essential facts, concepts, theories and principles of their engineering discipline, and its underpinning science and mathematics.

KU2

Have an appreciation of the wider multidisciplinary engineering context and its underlying principles.

S1

The ability to make general evaluations of commercial risks through some understanding of the basis of such risks.

S2

Extensive knowledge and understanding of management and business practices, and their limitations, and how

these may be applied appropriately to strategic and tactical issues.

P3

Understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, technology, development, etc).

P5

Awareness of nature of intellectual property and contractual issues.

US4

An awareness of developing technologies related to own specialisation.

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Links
[1] mailto:thwm100@cam.ac.uk
[2] https://www.vle.cam.ac.uk/mod/book/view.php?id=364101&chapterid=54001
[3] https://teaching17-18.eng.cam.ac.uk/content/form-conduct-examinations
[4] https://teaching17-18.eng.cam.ac.uk/content/uk-spec