Engineering Tripos Part IIB, 4E12: Project Management, 2023-24

Module Leader

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Lecturer

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Timing and Structure

Lent term. Eight 2-hour sessions + coursework. Assessment: 100% coursework (please see details below)

Aims

The aims of the course are to:

- introduce the principal elements of project management; equipping students with the basic skills to enable them to manage a project and to operate effectively as part of a project team.

Objectives

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

- use a set of tools and frameworks that enable effective project planning and execution.
- understand the need for appropriate governance structures and control systems in the delivery of project objectives.
- run a small scale project and to be an effective member of any project team.

Content

Session 1: Introduction to Project Management

- Wide applicability of Project Management (PM)
- Reasons why project fail
- History of PM: Roots of change
- Critical Path Method (CPM): Dragonfly Case - part 1

Session 2: Project Planning and Control

- Beyond the CPM; the PERT method
- EVA/ABC
- Design Structure Matrix
- Monte Carlo Simulation and Limitations
- Dragonfly Case - part II

Session 3: Ambiguity in Large Innovative Projects

- Flying Car Case
- Managing Residual Uncertainty
- Strategies for Managing Ambiguity

Session 4: Project Risk Management

- Intro to PM Risk Management
- Review of decision trees
- Real Options

Session 5: Managing Project Teams

- In-class exercise
- Heavyweight vs lightweight project managers
- Functional vs. project-based organizations

Session 7: Portfolio Management

- Scoring tables and financial indices: value and limitations
- Risk return matrices and visual tools
- The need for diversification in high risk projects

Session 8: Project Management Contracts

- Fixed fee/Time and Materials/Performance-based contracts
- Comparison and applicability of each contract type
- Risk-sharing through optimal contract design
- Barganining power and negotiations

Coursework

Individual Coursework (100%).

Coursework	Format	Due date & marks
[Coursework activity: Project Prioritization and Analysis / Final] Brief description You will be given a case study and asked to analyse the risk profiles of different projects portfolios. You will have to make a recommendation regarding what projects should the company select and defend your recommendation with both quantitative and qualitative arguments. <u>Learning objectives:</u> • Understand the complexity of project portfolio selection processes • Analyze the organizational dynamics that affect project execution in project teams • Analyze how collaborative agreements and contracts can affect project performance	Individual Report anonymously marked	Beginning o

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 [2].

UK-SPEC

This syllabus contributes to the following areas of the UK-SPEC [3] 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).

P7

Awareness of quality issues.

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