MSc Technology Management

Programme Specification

Primary Purpose

Course management and quality assurance.

Secondary Purpose

Detailed information for students, staff and employers. Current students should refer to the related Course Handbook for further detail.

Disclaimer

The University of Portsmouth has checked the information given in this Programme Specification Supplement. We will endeavour to deliver the course in keeping with this Programme Specification Supplement; however, changes may sometimes be required arising from annual monitoring, student feedback, review and update of units and courses. Where this activity leads to significant changes to units and courses, there will be prior consultation of students and others, wherever possible, and the University will take all reasonable steps to minimize disruption to students. It is also possible that the University may not be able to offer a unit or course for reasons outside of its control, for example; the absence of a member of staff or low student registration numbers. Where this is the case, the University will endeavour to inform applicants and students as soon as possible. Where appropriate, the University will facilitate the transfer of affected students to another suitable course.

Copyright

Contents

Course Details

1. Named Awards

MSc Technology Management

2. Course Code (and UCAS Code if applicable)

C0126F/P

3. Awarding Body

University of Portsmouth

4. Teaching Institution

University of Portsmouth

5. Accrediting Body

Institution of Mechanical Engineers (IMechE)

6. QAA Benchmark Groups

QAA Subject benchmark statement, Engineering, 2006

Engineering Council. UK standard for Professional Engineering Competence (UK-SPEC)

7. Document Control Information

Version 10.1, 2017

8. Effective Session

2017-2018

9. Author

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10. Faculty

Faculty of Technology

11. Department

School of Engineering

Curriculum

12. Educational Aims

The course aims to equip students to work as technologists/a member of management team or leader, at an advanced level, in the fields of engineering and technology management. In addition, and more generally:

- To develop an understanding of technology management techniques in order to provide individuals with the capability to accept broader and more responsible roles, both technical and managerial, within an atmosphere of continual change

- To engender an understanding of the management role in the investigation, implementation and operation of manufacturing and service systems
- To provide a broad appreciation of material resource utilisation and recovery with consideration of effective planning procedures for minimum waste

13. Reference Points

University of Portsmouth curricula framework

- The university policy on Key Skills
- The scholarship and research expertise of academic members of staff
- Framework for Higher Education Qualifications (FHEQ)
- National Qualifications Framework
- UK Standard for Professional Engineering Competence
- QAA UK Quality Code for Higher Education
- QAA's Engineering Subject Benchmark and the Engineering Council's UK-SPEC

The core elements of the engineering benchmark, interpreted in the context of mechanical engineering, manufacturing and technology management are:

- **Underpinning Science and Mathematics (US)**: Comprehensive knowledge and understanding of scientific principles and mathematics appropriate to mechanical engineering, manufacturing and technology management disciplines, to understand established and forefront knowledge and developments with particular reference to mechanics and dynamics, structure analysis, materials, manufacturing techniques and systems, industrial control systems, operations, quality, supply chain, resources and information management; Good awareness of established and newly emerging knowledge for developing insights into problems solving in mechanical, manufacturing and technology management disciples; Ability to effectively evaluate, apply and integrate knowledge and understanding of other engineering disciplines to support study of their own discipline.
- **Engineering Analysis (E)**: Understanding of engineering and technological principles and the ability to apply them to analyse key engineering components, processes and systems; Investigate and evaluate established and new or emerging technologies; Ability to identify, classify and describe the performance of systems and components through analytical methods and modelling techniques; Ability to apply quantitative methods and computer software to mechanical, manufacturing and technology management problems and the ability to assess the limitations of particular cases; Understanding of and ability to generate practical solutions to engineering and technological problems in such areas as mechanics, structural analysis, materials, control systems, manufacturing processes and systems, operations and quality management; Ability to extract data pertinent to an unfamiliar problem and apply in its solution using computer based engineering analysis tools when appropriate.
- **Design (D)**: Creation and development of components, processes and systems or enhancements of existing ones by reflecting the changing of operating environment; Developing knowledge, understanding and skills to conceive, identify and design for creating practical solutions within the constraints and limitations; Wide knowledge and comprehensive understanding of design processes, methodologies and software packages.
- **Economic, Social and Environmental Context (S)**: Knowledge and understanding of commercial and economic context of engineering processes and management; Knowledge of management techniques which may be used to achieve engineering objectives, sustainable development; Ability to make general evaluations of commercial risks through some understanding of the basis of such risks; Awareness of relevant legal requirements including personnel, health, safety and risk issues; Extensive knowledge and understanding of optimisation of resources, financial constraints, social and environmental impact of components, processes and system development; Acquiring good business operation and management practices and applying them appropriately; Understanding of the need for a high level of professional and ethical conduct.

- **Engineering Practice (P)**: A thorough understanding of current mechanical engineering, manufacturing technology and management practices and their limitations; Ability to apply mechanical engineering, manufacturing, technology management techniques with commercial and industrial constraints being taken into consideration; Good knowledge of characteristics of engineering materials, equipment, manufacturing processes and systems; Extensive knowledge of engineering and technological project management methods, including initiation, planning, execution, monitoring and controlling, reporting and completion; Use of technical literature and other information sources; Awareness of nature of ethical, intellectual property and contractual issues; Understanding of appropriate codes of practice and industry standards; Awareness of quality issues; Ability to work with technical uncertainty.

The abbreviations in parentheses are used for cross reference purposes in the learning outcomes in Section 14.

14. General Learning Outcomes

Level 7

Master's degrees are awarded to students who have demonstrated:

- a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their academic discipline, field of study or area of professional practice
- a comprehensive understanding of techniques applicable to their own research or advanced scholarship
- originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline
- conceptual understanding that enables the student:
  - to evaluate critically current research and advanced scholarship in the discipline
  - to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses

Typically, holders of the qualification will be able to:

- deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences
- demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level
- continue to advance their knowledge and understanding, and to develop new skills to a high level

And holders will have:

- the qualities and transferable skills necessary for employment requiring:
  - the exercise of initiative and personal responsibility
  - decision-making in complex and unpredictable situations
- the independent learning ability required for continuing professional development

15. Learning Outcomes

A. Knowledge and Understanding of:

A.1 Principles, procedures, strategies and general practice for engineering and technology management
A.2 Management and optimisation of manufacturing system and supply chain design
A.3 Design and control of production systems by existing and emerging management strategies directed at achieving total product quality

A.4 Management and optimisation of information and resources for engineering and technology applications
A.5 Systems for discard, handling and recovery of waste materials
A.6 Strategic and operational management of engineering and technology

B. Cognitive (Intellectual or Thinking) Skills, able to:

B.1 Critically design, schedule and control manufacturing operations
B.2 Critically design and implement information management and resources optimisation
B.3 Critically formulate a strategy and operations for organisational structure, project and change management
B.4 Select and evaluate optimum processes and systems
B.5 Develop and maintain operations to meet quality standards throughout manufacturing, organization and supplier networks
B.6 Formulate, plan, manage, evaluate and present an engineering and technology management project

C. Practical (Professional or Subject) Skills, able to:

C.1 Identify constraints and exploit opportunities for technology development and transfer
C.2 Design and implement manufacturing systems and resources management and optimisation
C.3 Reflects on and understand the technology management in economic, social, ethical and environmental context
C.4 Systematically manage and optimise resources and information utilization
C.5 Use commercial software for modelling and simulation.
C.6 Design and manage supply networks, quality, materials, and energy and total life cycle usage

D. Transferable (Graduate and Employability) Skills, able to:

D.1 Work effectively as an individual and as part of a team in problem solving and technology management
D.2 Apply appropriate mathematical and analytical techniques in engineering and technology management
D.3 Communicate effectively in writing and other viable and appropriate forms of presentation for research outcomes dissemination
D.4 Selectively use IT skills in the technology information, resources, supply chain design and simulation manufacturing systems for optimisation and innovation
D.5 Apply theories and analytical/modelling/simulation techniques for information and resources management and optimisation
D.6 Ability to work effectively in multi-disciplinary areas for operational and strategic management and optimisation

16. Learning and Teaching Strategies and Methods

Core knowledge is acquired through laboratory work and taught class based lectures, tutorials and seminar sessions which include the use of video, case studies and intranet. Individual learning is supported by directed reading, study guides, case studies and intranets.

Intellectual skills are developed through class sessions, seminars and computer laboratories. The use of case studies, worked examples and journal papers helps prepare students to think critically and challenge conventional methods and procedures.

Computer based exercises are used to develop technological skills. Practical skills are developed through the use of case studies and tutorial material.

These skills are developed by individual and group presentations, case studies giving examples of best practice in engineering problem solving and team working to demonstrate the integration of engineering and other disciplines.

17. Assessment Strategy

Testing of core knowledge is largely undertaken through coursework and examinations. Coursework will be assessed through presentations, reports and essays. Activities involving the use of application software are generally assessed by assignment work, reports and tests.

Use is made of examinations for assessing intellectual and analytical skills together with presentations, dissertations and reports for practical and project work.

Case study analysis and presentations are used in assessment of 'real world' problems. Simulation and other computer based activities are assessed by report. Numerical and analytic skills for practical applications are assessed by exam.

The ability to achieve goals and communicate effectively is particularly assessed through project activities including project management. Numerical skills are assessed through the mathematics content of units. IT skills are assessed as part of those units which include computing, web design, manufacturing system design and the presentation of reports.

18. Course Structure, Progression and Award Requirements

See Unit Web Search[1] for full details on the course structure and units

This is one year programme for full-time students and three year programme for part-time students. The course normally consists of 20 credit point units, where 20 credits represent 200 hours of study time and usually includes up to 48 hours of time-tabled activities. The course offers a total 180 credits for the MSc award and ends with a 60 credit individual project. A Postgraduate Diploma exit award requires 120 credits. A Postgraduate Certificate exit award requires 60 credits from the taught units. The individual project may be undertaken at the University or, given agreement on supervision arrangements, in industry

19. Employability Statement

- The course is aimed at the students who wish to undertake careers in the engineering and technology management. The examples and case studies used in the course are all designed to increase the students' knowledge of the theory and practice of engineering and technology management hence enhance their employability
- The final project allows students to investigate a significant engineering and technology management problem and/or strategic and operational management. This may be industrial project subject to availability.
- Seminars from experts in the field from academia and industry will, subject to availability, be arranged during the academic year and students will be encouraged to attend.
- All units have aspects which contribute to the development of employability skills and/or research skills for further study.

Course Management

20. Support for Student Learning

- The Course is managed by a Course Leader.
- Extensive induction programme introduces the student to the University and their course.
- Each student has a personal tutor, responsible for pastoral support and guidance.
- University support services include careers, financial advice, housing, counselling etc.
- The Academic Skills Unit (ASK).
- The Additional Support and Disability Advice Centre (ASDAC).

[1] www.port.ac.uk/unitwebsearch

- Excellent library facilities.
- The University of Portsmouth has consistently been awarded an excellent rating for student support and guidance in a number of Quality Assurance Agency inspections.
- Student course and unit handbooks provide information about the course structure and University regulations etc.
- Feedback is provided for all assessments.
- Excellent laboratories equipped with the-state-of-art facilities and software for design, simulation, modelling, computation, rapid prototyping, manufacturing, measurement, testing, characterisation and analysis within the Regional Centre for Manufacturing Industry (RCMI), Advanced Polymer Composites (APC), Aerospace Materials and Structures, Biomechanics and Systems Engineering research groups.

21. Admissions Criteria

A. Academic Admissions Criteria

Standard University rules apply and this will normally mean that candidates are in possession of an honours degree with at least a classification of 2.2 or equivalent and in a relevant discipline. All other qualifications or experience presented must be forwarded to the Admissions Tutor for a University of Portsmouth decision. English – IELTS 6 or TOEFL 550 (215 computer-based).

B. Disability

The University makes no distinction in its admissions policy with regard to disability and will endeavour to make all reasonable adjustments in order to make it possible for students to study at Portsmouth on a course of their choice.

22. Evaluation and Enhancement of Standards and Quality in Learning and Teaching

A. Mechanisms for Review and Evaluation

- Course Leader's Annual Standards and Quality Evaluative Review.
- Head of Department's Annual Standards and Quality Evaluative Review.
- Unit and Course Level student feedback considered at Board of Studies.
- Unit Assessment Board consideration of student performance for each programme.
- Annual Standards and Quality Reports to Board of Studies, including consideration of Subject and Award External Examiner Reports.
- Periodic Programme Review.
- Student Representatives and Student/Staff Consultative Committees.
- National Student Survey.
- Staff Performance and Development Review.
- Peer Review and Development Framework.
- Faculty Learning and Teaching Committee.

B. Responsibilities for Monitoring and Evaluation

- Unit Co-ordinators for unit content and delivery.
- Course Leader for day-to-day running of course.
- Board of Studies with overall responsibilities for operation and content of course.
- Head of Department.
- Associate Dean (Academic).
- Associate Dean (Students).
- Quality Assurance Committee.

- Unit, Award and Progression Board of Examiners.

C. Mechanisms for Gaining Student Feedback

- Student Representation on Board of Studies.
- Student Staff Consultative Committees.
- Unit and Course level student feedback questionnaires.
- University participates in external student surveys, e.g. National Student Survey (NSS).
- Postgraduate Research Experience Survey (PRES) and International Student Barometer (ISB).

D. Staff Development Priorities

- Academic staff undertake activities related to research, scholarship, teaching and learning and student support and guidance.
- Annual staff performance and development reviews match development to needs.
- Managers undertake a variety of management development programmes.
- All academic staff encouraged to seek Higher Education Academy membership.
- Support Staff are encouraged to attend short courses in areas such as minute taking, and specific IT packages

23. Assessment Regulations

The current University of Portsmouth academic regulations will apply to this programme (*see Assessment and Regulations*[2]).

24. Role of Externals

Subject External Examiners who will:

- Oversee unit assessment and usually attend Unit Assessment Boards
- Review unit assessment strategy
- Sample assessment artefacts
- Present report to Unit Assessment Boards

Award External Examiners (usually also a Subject External Examiner) who will:

- Oversee and attend Award/Progression Boards
- Scrutinise and endorse the outcomes of assessment
- Ensure that the standard of the award is maintained at a level comparable with that of similar awards elsewhere in the United Kingdom

25. Indicators of Standards and Quality

A. Professional Accreditation/Recognition

IMechE as suitable further learning for CEng status

B. Periodic Programme Review (or equivalent)

Successful Periodic Programme Review 12th March 2013, confirming both fitness of purpose of curriculum and effectiveness of annual monitoring and review processes.

C. Quality Assurance Agency

QAA Higher Education Review, March 2015, judgements about standards and quality meet UK expectations (*for full report see Higher Education Review of the University of Portsmouth, March 2015*[3]).

[2] www.port.ac.uk/departments/services/academicregistry/qualitymanagementdivision/assessmentandregulations/

D. Others

Research based in the mechanical engineering and manufacturing area in the School was ranked third overall out of new universities submitted in the Unit of Aeronautical, Mechanical, Chemical and Manufacturing Engineering in The Research Excellence Framework (REF) 2014. 61% of our research outputs were rated as either world-leading or internationally excellent. 50% of our research overall was rated as either world leading or internationally excellent. 50% of our impact was rated as having very considerable reach and significance.

26. Further Information

Further information may be found in:

- Student Handbook
- University of Portsmouth Curriculum Framework Document
- University of Portsmouth Prospectus
- University of Portsmouth[4] and School/Department[5] websites

[3] www.qaa.ac.uk/en/ReviewsAndReports/Documents/University%20of%20Portsmouth/University-of-Portsmouth-HER-15.pdf

[4] www.port.ac.uk/

[5] http://www.port.ac.uk/school-of-engineering/