MSc Software Engineering

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. We will endeavour to deliver the course in keeping with this Programme Specification; 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.

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Course Details

1.   Named Awards

Software Engineering

2.   Course Code (and UCAS Code if applicable)

C1707 P and F

3.   Awarding Body

University of Portsmouth

4.   Teaching Institution

University of Portsmouth

5.   Accrediting Body

British Computer Society

6.   QAA Benchmark Groups

Computing Benchmark

7.   Document Control Information

Version 2.3, September 2017

8.   Effective Session

2017-18

9.   Author

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 Dr J Crellin

10. Faculty

Faculty of Technology

11. Department

School of Computing

Curriculum

12. Educational Aims

The course aims to equip students to work as professional software engineers within software development and system environments.

This Masters Programme is aimed at supporting the software industry and designed to give postgraduate students knowledge and skills in the key areas of existing and emerging software techniques against a competitive software market need. Such postgraduate professionals will be able to manage effectively the whole chain of processes involved in building complex systems that

integrate several technologies and involve different requirements. In addition, and more generally, the course aims to:

- Provide a challenging, stimulating and self-rewarding study environment.
- Accommodate student needs in relation to maximising their career potential by enabling them to develop knowledge, understanding and skills in software development, and undertake appropriate during within an extended project.

13. Reference Points

The University's Mission Statement commitment to "widen access and increase market orientation, develop franchising and to expand internationally in response to demographic, economic and political trends" provides a timely stimulus to prioritise the development of this postgraduate degree programme. The programme design is a direct response to requests from home and overseas students and from our Industrial Advisory Groups for vocationally-oriented and multi-disciplinary programmes related to existing and emerging technologies in software technologies and clearly widens the range of provision of postgraduate programmes.

Reference Points

- University of Portsmouth Curriculum Framework Document (September 2014)
- The scholarship and research expertise of academic members of staff
- The QAA UK Code for Higher Education
- Framework for Higher Education Qualifications (FHEQ) (if applicable, specify which sections are most applicable, e.g. Collaborative provisions)
- National Qualifications Framework
- Subject Benchmark Statement for Master's Degrees in Computing (2011).

The programme has been designed with reference to the following elements of the subject benchmark statement: 5.1 Subject knowledge and understanding and 5.2 Subject-specific skills (learning outcomes sections A, B and C below); 5.3-5.5 Generic (transferable) skills (learning outcomes section D).

The programme draws upon the following areas from Section 2 (Nature and Extent of Computing) of the subject benchmark statement on the nature and extent of computing:

- Foundational issues (FI): theoretical foundations, formal aspects which facilitate automation; programming languages, compilers and programming environments; concept of a pattern, notions of re-use; ideas of abstraction and design; life cycle and process concepts; professional, legal, social and ethical concerns.
- Major Technologies (MT): techniques of software construction and development; pervasive computing, including mobile computing systems and the interface with telecommunications; the human computer interface; concerns for security, integrity and safety.
- Specialisms and sub-disciplines (SS): the established discipline of software engineering; systems concerns, the need to take a holistic perspective in the development of computing systems.

14. General Learning Outcomes

<u>Level 7</u>

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   Organisation of software systems, systems components, and their interactions (FI, MT, SS).

A.2   Software engineering methodologies and the management of complex software projects (FI, MT, SS).

A.3   Advanced program development techniques (FI).

A.4   Software requirements engineering (FI, MT, SS).

A.5   Formal specification, modelling and development of software (FI, MT, SS).

A.6   Development of software applications for the web and mobile computing devices (MT).

A.7   General software security in computer systems and legal and ethical issues, addressed as part of the software engineering discipline (FI, MT).

A.8   The industrial and commercial context of software engineering (FI, SS).

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

B.1   Develop general abilities of an intellectual, analytical problem-solving nature related to technology.

B.2   Critically evaluate information needs against requirements and associated available technology.

B.3   Develop critical skills with regard to literature searching, appraising and evaluating from a variety of sources and synthesising the results.

B.4   Apply professional codes of conduct and appreciate the ethical considerations that underpin them.

B.5   Critically review complex documents and lucidly explain them to interested parties.

B.6   Plan, manage, undertake and report on a significant software-related project.

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

C.1   Critically evaluate software products in order to advise on their use.

C.2   Devise strategic communication plans for software projects.

C.3   Design, implement, test and evaluate software for wide range of applications.

C.4   Prepare written software documentations, and evaluative reviews of academic software engineering related journal articles.

C.5   Apply professional practice in the preparation of computer software systems for customer interaction.

C.6   Develop software products for use in complex corporate systems.

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

D.1   Communicate effectively in writing, speaking and in other appropriate forms of presentation.

D.2   Read and understand documents related to software specification and systems.

D.3   Use information technology to handle data, simulation and assist with design and testing.

D.4   Apply reflective techniques in appraising one's own performance.

D.5   Assess problem domains and devise appropriate problem solving strategies.

D.6   Build on previous experience in order to generalise.

D.7   Ability to work in teams to achieve goals but nevertheless be distinctively individual.

16. Learning and Teaching Strategies and Methods

Core knowledge is acquired through computer laboratory work and taught class based lectures and seminar sessions. Individual learning will be supported by directed reading, study guides, case studies, laboratory sessions and preparation of journal article reviews.

Cognitive skills are developed through the class sessions and through the computer laboratory sessions based on case studies. The use of case studies, worked examples and journal papers helps prepare students to think critically and be aware of technological developments and their impact on software development. The ability to plan and manage software development against a given brief and reflect on the results will be addressed during case studies and coursework. Abilities related to dealing with complex projects are acquired through material on research and communication techniques, a range of practical sessions in various units, and the Project.

Practical skills are developed through the use of case studies and analysis of case histories. Laboratory based exercises will be used to develop technological skills.

Communications skills and problem solving skills are developed, extended and refined in Supervised Work Sessions which form part of the unit assessments for the majority of the units. Application of Number is developed via case studies and research exercises. Skills directed towards improving own learning and performance are identified, discussed and developed and by extensive and detailed feedback to students following assessments. Supervised Work Sessions and group assignments for assessment provide opportunities for the development of skills in Working with Others; such skills are further refined during the Project unit.

17. Assessment Strategy

Testing of core knowledge is largely undertaken through coursework and unseen examinations. Coursework may be assessed through presentations, reflective reports, essays and reviews of journal papers. Software design and related activities are assessed by assignment work, reports, tests and simulation exercises.

Seen and unseen time constrained assessments plus the use of coursework assignments. In addition extended review articles and laboratory sessions will be used to develop critical skills.

Case studies, class reports and time constrained assessments based in laboratories

Key skills are assessed through the project activities (group and individual) and through Supervised Work Sessions and group assignments and written exams.

18. Course Structure, Progression and Award Requirements

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

- Two routes are offered for the MSc Software Engineering degree: a full time, version lasting 12 months and a part-time version lasting 3 years depending on the timing of the student's project unit
- Except for the Project unit, which is 60 credits, all other units are 30 credits and each requires a notional 300 hours of work.

19. Employability Statement

There continue to be excellent employment opportunities in software engineering and software development for candidates with suitable skills. The continued rate of change and development of technology means that new opportunities (and skills) are continually arising. This course addresses the needs of students by ensuring unit content remains highly current, and addresses new employment opportunities as they arise. Informal links between the course team and employers mean that many projects are sponsored by external employees, giving students the opportunity to experience consultant/ client working opportunities. Personal Development Planning during personal tutoring is used to help the student develop their employment qualities, and to clearly understand their personal strengths and weaknesses in employment (as well as study) terms.

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 and counselling
- The Academic Skills Unit (ASK)
- The Additional Support and Disability Advice Centre (ASDAC)
- Excellent library facilities
- Student course and unit handbooks provide information about the course structure and University regulations
- Feedback is provided for all assessments
- Personal Development Planning (PDP) for all awards

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 in a computer science or software engineering or a related discipline. All other qualifications or experience presented must be forwarded to the Head of School for a decision on acceptance. Evidence of competence in the use of the English Language must be demonstrated, typically by an IELTS score of 6.5 where candidate's first language is not English.

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

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 School'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 School.
- 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, eg 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.
- Academic staff new to teaching required to undertake Initial Professional Development Programme (iPROF).
- 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

The course is accredited by the British Computer Society (for CITP further learning and partially for CEng). Re-accredited in 2014.

B. Periodic Programme Review (or equivalent)

Successful review, March 2015.

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]).

D. Teaching Excellence Framework

Institution awarded TEF Gold (*for report see Statement of Findings from the TEF Panel, June 2017*).

E. Others

All staff teaching on the course are research active.

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

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

[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-computing/