

Programme Specification: MSc Computing (Dependable Software)

1. Awarding Institution/Body	University of Gloucestershire
2. Teaching Institution	University of Gloucestershire
3. Recognition by Professional Body.	
4. Final award and level of qualification	MSc
5. Modular Scheme or other	N/A
6. Programme title (name on certificate)	Computing (Dependable Software)
7. UCAS code	N/A
8. JACS code	G600
9. QAA subject benchmark statement(s) where relevant	This Programme Specification has been informed by: <i>Subject Benchmark Statement Master's degrees in computing 2011</i> UK Quality Assurance Agency (QAA)
10. Date of initial validation	May 2007 (Computing with Software Engineering)
11. Date of revision	March 2012

12. External and Internal reference points

The educational aims and outcomes of the programme have been written with reference to the following reference points.

12a) EXTERNAL

- ❖ the Framework for Higher Education Qualifications (FHEQ);
- ❖ the QAA Benchmark statement(s) (B);
- ❖ BCS accreditation guide;

Further details for the above are available at the relevant website(s).

12b) INTERNAL

- ❖ University of Gloucestershire Academic Regulations for Taught Provision (ARTP);
- ❖ University of Gloucestershire Learning and Teaching strategy (LTS);
- ❖ Other specified policies e.g. Sustainability, AWP and Student Charter.

Further details for the above are available at the University website

13. Main educational aims of the programme

The main educational aims of Computing (Dependable Software) are to provide you, the student, with opportunities to:

1. develop the practical and critically evaluative skills required to be directly employable in the computing industry
2. obtain comprehensive knowledge of IT/IS project management from practical IT/IS projects **(B)**
3. gain a critical understanding of the technologies and human factors required for developing applications **(B)**
4. develop a critical understanding of professional, legal and ethical issues and practice within the computing industry **(B)**
5. develop and deepen skills involved in carrying out academic research
6. acquire a deep and critical understanding of how features in a range of different programming languages support or hinder the development of dependable software
7. gain a sound knowledge and judgement of the techniques and processes needed to ensure a high quality, dependable, software system

14. Programme outcomes

The programme provides opportunities for you, the student, to achieve and demonstrate the following learning outcomes:

14a) Knowledge and understanding of:

1. theories, systems and technologies that underpin the development of digital applications **(B)**
2. the needs of users, taking into account cognitive processing limits in the design of interactive human-computer interfaces **(B)**
3. the numerical methods and skills required of the computing professional in planning, researching and developing a variety of projects and products **(B)**
4. professional, legal, ethical and societal issues and practice within the computing
5. a range of features found in modern languages and their role in developing dependable software
6. quality processes, techniques and standards used in the development of dependable software

14b) Intellectual/ thinking skills – able to:

1. apply critical reasoning and problem solving in both practical development and theoretical academic settings, forming abstractions from the real world.(B)
2. apply investigative and scholarly techniques in researching a topic or problem in the published literature.
3. analyze and interpret data from a variety of sources, including published literature, systematic tests and observations
4. synthesize evidence and apply logical reasoning techniques to formulate arguments and arrive at conclusions.

14c) Subject specific /Practical and professional skills – able to:

1. analyse, evaluate and solve complex computing-related problems , by building on current developments, available software and appropriate development processes (B)
2. utilise computer programming skills to create computing applications
3. maintain up-to-date knowledge of technological developments and dealing with technical uncertainty by setting goals, performing effective research and identifying resources (B)
4. synthesise and critically evaluate the important issues within the profession.(B)
5. apply the tools and techniques of project management
6. form abstractions from the real world using a variety of systems modelling notations
7. produce dependable software systems, either in their entirety or by adaptation, that can interface with other systems

14d) Transferable/key skills – able to:

1. manage their own time and organise their own practice, identifying relevant knowledge, skills and supporting tools to achieve identified goals
2. communicate effectively through written and verbal media using well reasoned, logical arguments and engage in constructive discussion with peers and wider audiences
3. demonstrate interpersonal skills and the ability to work effectively with others to achieve common goals
4. demonstrate an ability to critically review the literature, which includes identifying all of the key developments in a particular area of study, critically analyzing them and identifying limitations and avenues for further development or explanation (B)
5. demonstrate an ability to recognize and respond to opportunities for innovation (B)

15. Teaching, learning and assessment

The teaching, learning and assessment strategies and methods used in the programme to enable learning outcomes to be achieved and demonstrated by you, the student.

15a) Teaching and learning methods

In order to develop knowledge, understanding and intellectual skills, students will engage with a wide variety of learning techniques throughout their MSc programme, including lectures, lecture-led workshops, guest lectures, case studies, demonstrations, seminar discussions, computer laboratory sessions, student presentations, criticisms and research exercises. Students are supported in their learning through resources provided by tutors, but are also expected to carry out their own research and independent study using a variety of printed and electronic sources and to synthesise the information or data to form appropriate conclusions.

The study of computing is inherently vocational, creative, numerical and technical, requiring effective and efficient solutions to complex problems. Problem solving is a key requirement for programming, web design, interface design and project management, and is developed through individual and group based case studies and practical activities including analysis, design, implementation and critical evaluation.

15b) Assessment

Assessment methods include essays, case studies, examinations, presentations, projects, systems design and development exercises and software evaluation/comparisons as appropriate. These assessments will require students to use a wide range of quality information sources as the evidence base for assessments, demonstrate skills of analysis, evaluation and synthesis, and communicate effectively in both written and verbal formats. At the Masters' stage, assessment takes the form of a dissertation where, in addition to the written submission, students are required to give an oral presentation of their work in order to share their experiences and findings with their peers and assessors.

16. Programme Map

Code	Title	Status	Credits
Postgraduate Certificate		60 Credits	
COM495	Database Management	■	15
COM492	IT Project Management	■	15
	Option	□	15
COM465	Programming Languages and Dependability	■	15
Postgraduate Diploma		60 Credits	

COM493	Digital Innovation and Usability	■	15
COM494	Research Methods for Information Technology	■	15
COM491	Professional Practice in Enterprise Computing	■	15
COM466	Development of Dependable Software	■	15
MSc		60 Credits	
COM404	Dissertation	■	60

■ Compulsory module

□ Option

17. Programme Overview

The programme is offered in the following modes of study: Full-time, Part-Time.

Staged awards are available within this programme of study, see section 4.

Students may enter, interrupt or leave a programme at the end of each Level.

The language of study is English.

17a) Structure, key features and modules

This section of the programme specification should be read with reference to section 16, the programme map. Modules may be compulsory, core or optional and may have specific pre-requisites.

This course provides a specialist Dependable Software development course within the MSc Computing suite. The course builds on existing programming skills and focuses on the knowledge and application needed to develop correct, robust and secure software that is dependable. It looks at low-level, language issues and the role of the development process. The development of this course has been informed by detailed discussions with representatives from industry.

Students will analyse existing code, select appropriate design methodologies, choose suitable programming language and devise effective verification and validation techniques. They will be introduced to appropriate tools and processes.

The MSc Computing shell provides a framework for all awards, and contains the compulsory elements and requisite skills that underpin every course. It introduces knowledge and understanding of professional practice and ethics which will serve students well in their professional working lives as well as a sound basis in research methods to support their MSc dissertation work and beyond. Students can expect to gain knowledge of IT project

management techniques that they can then apply when they conduct the project work at diploma level and in their dissertation. They have an opportunity to use their knowledge creatively, but within a well-defined and well-supported framework in the project module. The 60 credit dissertation allows students to research deeply in their programme area and to develop real expertise at the forefront of technology. The Computing shell will develop transferable skills to underpin a successful career in the increasingly important and rapidly expanding IT industry.

Opportunities for Personal Development Planning (PDP) and Career Planning are available throughout the course, beginning with induction. The Careers Office provides support for progression beyond the course. Tutors and the Course Leader are also available to help identify, develop and monitor the identified goals for the students on the course. For example, one student who was successful through several interview stages with BT was helped with the final presentation by the Careers Office and supported throughout the process by the Course Leader. Another student, who reached 'max fail' in this institution was advised and supported by the Course Leader so he gained a place elsewhere to restart his studies.

The Department has strong links with industry through the Knowledge Transfer Programme (KTP) that informs teaching and provides case studies. This, coupled with the Joint Programme of seminars with the British Computer Society and Institute of Engineering and Technology, provides students with engagement with a wider IT perspective and an opportunity for further personal development. Such events provide an excellent forum for students to gain an insight into the developments in the wider business and industrial world and focus or reshape their career plans accordingly.

Stages in their progress are reviewed periodically and students are advised on their areas of strengths or weaknesses as required in relation to their future career prospects. In particular, the compulsory modules COM704 (Research Methods) and COM701 (Professional Practice), with their emphasis on the development of the dissertation proposal and professional development, will enable a student to integrate and reflect on the PDP issues involved.

17b) Credit and award requirements

180 CAT points

The requirements for the Postgraduate Certificate (PGC) in Computing are successful completion of:

60 CATS points, normally COM491 + COM495 + COM465 + 15-credit option

The requirements for the Postgraduate Diploma (PGD) in Computing (Dependable Software) are successful completion of:

120 CATS points including COM491 + COM492 + COM493 + COM494 + COM495+ COM465 + COM466 + 15-credit option

The requirements for the MSc in Computing (Dependable Software) are successful completion of:

PGD + COM404

18. Additional information

Further information on Assessment; Quality Assurance including Evaluation; Disability and Learning support provision; Criteria for Admission/Recruitment and Careers can be found at the University website.

The National Recognition Information Centre (NARIC) provides details of comparative information on all Higher Education programmes.