**UNIVERSITY OF
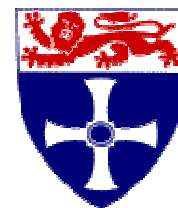NEWCASTLE UPON TYNE**

**FACULTY OF
SCIENCE, AGRICULTURE & ENGINEERING**

DEGREE PROGRAMME SPECIFICATION

**UNIVERSITY OF
NEWCASTLE**

1.	**Awarding Institution**	University of Newcastle upon Tyne
2.	**Teaching Institution**	University of Newcastle upon Tyne
3.	**Final Award**	MSc
4.	**Programme Title**	Computing Science
5.	**Programme Accredited by:**	British Computer Society
6.	**UCAS Code**	N/A
7.	**QAA Benchmarking Group(s)**	Computing Science
8.	**Date of production/revision**	28/9/04

9.   Programme Aims:

- To produce graduates who will have an understanding of the theory and principles which underlie Computing Science and Software Engineering. They will have knowledge and experience of the fundamental techniques used in requirements analysis, specification, design, development, validation, documentation, maintenance and evaluation of software systems in accordance with modern principles of Software Engineering. They will have skills in the application of these techniques in the development of systems software and software for a range of applications. They will also have an understanding of the architectural concepts underlying the hardware systems on which such software is run. Graduates will have experience of a range of software and hardware systems in current use in the profession, an understanding of current trends in their development, and an appreciation of the professional, ethical and social dimensions of the subject. Graduates will have demonstrated the ability to apply the principles and practices of Computing Science in tackling a significant technical problem; the solution typically demonstrates a soundly based vision of the direction of developments of Computing Science. Graduates will have a good understanding of issues at the forefront of Computing Science and will have a knowledge of up to date tools and techniques. They will be able to critically evaluate and test Computing systems. Many graduates go on to employment in technical positions in software houses and with large-scale users; some graduates pursue research careers. Some students seek to develop market-niche software in small companies.

- To provide a programme which meets the FHEQ at Masters level and which takes appropriate account of the draft subject benchmark statements in Computing.

10. Intended Learning Outcomes; Teaching and Learning Strategies and Methods; Assessment Strategies and Methods

A   Knowledge and understanding

A successful student will have gained and be able to demonstrate knowledge and understanding of:

A1. A high level programming language

A2. A number of applications within Computing Science

A3. The principles of software engineering

A4. Techniques for the development of algorithms for a range of applications

A5. Computer organisation and architectures

A6. Professional issues to cover: social, ethical and legal aspects

A7. Some of the theoretical foundations of Computing Science

Teaching & Learning Strategy

Lectures are the main way of imparting knowledge and understanding (A1-A7). Practical classes feature prominently, especially to support the programming and software engineering modules (A1, A3). Students are expected to contribute to their own learning experience by independent reading. They are provided with references to books which are categorised as *essential*, *recommended*, and *background* reading, as well as scientific papers and other learning materials including appropriate web URLs.

Assessment strategy

Knowledge and understanding are assessed by means of closed and open book written examinations, and coursework, including group and individual project reports (A1-A6).

B   Subject –specific/professional skills

A successful student will be able to demonstrate skills in:

B1. The process of software development

B2. The use of hardware and software systems

B3. The identification and implementation of appropriate algorithms and data structures

B4. The use and provision of network information services

B5. The use of programming languages

B6. Analysis of system requirements and the production of system specifications

Teaching & Learning Strategy

B1-B6 feature prominently in all modules. In particular a group project within CSC841 gives students experience of working within teams to engineer a complex piece of software (B1-B6). An individual project during Semester 3 requires students to develop a large piece of software to a customer's requirements (B1-B6). In all other modules, coursework is used to develop these skills (B1-B6).

Assessment strategy

Subject-specific and professional skills are assessed by coursework (B1-B6).

C   Cognitive skills

A successful student will have the ability to:

C1. Conduct investigations using the technical and professional literature

C2. Use and evaluate appropriate tools and techniques

C3. Undertake critical evaluation (both theoretical and empirical) of alternative solutions

C4. Formulate problems and identify suitable approaches to solving them

C5. Reason abstractly about the structure and behaviour of computer systems

All modules involve coursework, much of which involves problem solving skills (C4). This is especially so in the group and individual projects where students need to select, evaluate and apply appropriate tools and techniques (C2). Here and elsewhere students will need to investigate possible alternatives in the technical and professional literature (C1, C3), and to reason about computer systems (C5).

Assessment strategy
Cognitive skills are assessed by a range of coursework (reports, design documents, etc.) (C1-C5).

D   Key (transferable) skills
A successful student will be proficient in:
D1. Written communication
D2. Problem solving
D3. Interpersonal communication
D4. Initiative
D5. Oral presentation
D6. Adaptability
D7. Teamwork
D8. Planning and organisation
D9. Computer literacy

The above covers the generic knowledge and understanding, subject/specific/professional skills, cognitive skills and key (transferable) skills of a 'typical' Masters level graduate, although for each individual student there will be variations depending on the dissertation taken during Semester 3.

Teaching & Learning Strategy
Key skills feature throughout the programme; teamwork in the CSC841 group project (D7); oral presentation, interpersonal communication, and planning and organisation in the Semester 3 Project module (CSC899), as well as the group project (D3, D5, D8); written communication in all modules, but especially in the Semester 3 project (D1); problem solving, initiative and adaptability are necessarily covered throughout the programme (D2, D4, D6, D9).

The strategy of the degree programme is to give a broad coverage of the subject of Computing Science in Semesters 1 and 2, and then to provide specialisation in the project undertaken in Semester 3.

Assessment strategy
Key (transferable) skills are assessed by both written and oral presentations (D1-D9). Teamwork in the group project is assessed both by the module leader at team oral presentations and by a group monitor (a member of teaching staff) who attends group formal meetings (D5, D7).

11   Programme Features, Structure and Curriculum

A & B Programme Features & Structure
All modules are compulsory. The course has 180 credits. The taught part of the course takes place from September to June. There are six taught 20-credit modules split equally across semesters one and two. In June students begin work on the 60-credit individual project which is submitted at the end of August.

C   Programme Curriculum

Degree of Master of Science in Computing Science (Full Time or Part Time)

Code: 5055

1. The full-time programme of study begins in September and lasts for 12 months. During Semesters 1 and 2 students take mandatory modules with a total value of 120 credits.

2. All candidates shall take the following compulsory modules:

Code   Credits Descriptive title
CSC842 (20)   Computer Environments
CSC844 (20)   Advanced Programming
CSC845 (20)   Networks and Web Technologies
CSC841 (20)   Software Engineering with Group Project
CSC843 (20)   Requirements Analysis and Database Design
CSC812 (20)   Programming and Data Structures

Development of specific Intended Learning Outcomes occurs through the following modules (compulsory modules in bold text, optional modules in normal, italic text)

A1	A good knowledge of a high level programming language	**CSC812, CSC841, CSC844.**
A2	A number of applications within Computing Science	**CSC812, CSC841, CSC842, CSC843, CSC844.**
A3	The principles of software engineering	**CSC812, CSC841, CSC842, CSC843, CSC844.**
A4	Techniques for the development of algorithms for a range of applications	**CSC812, CSC842, CSC844.**
A5	Computer organisation and architectures	**CSC842, CSC843.**
A6	Professional issues to cover: social, ethical and legal aspects	**CSC841, CSC842, CSC843.**
A7	Some of the theoretical foundations of Computing Science	**CSC844.**
B1	The process of software development	**CSC812, CSC841, CSC842, CSC843.**
B2	The use of hardware and software systems	**CSC812, CSC842, CSC843.**
B3	The identification and implementation of appropriate algorithms and data structures	**CSC812, CSC841, CSC842.**
B4	The use and provision of network information services	**CSC812, CSC842, CSC843, CSC845.**

B5	The use of programming languages	**CSC812, CSC844.**
C1	The ability to conduct investigations using the technical and professional literature	**CSC812, CSC841, CSC843, CSC899.**
C2	The ability to use and evaluate appropriate tools and techniques	**CSC812, CSC841, CSC842, CSC843, CSC899.**
C3	The ability to undertake critical evaluation (both theoretical and empirical) of alternative solutions	**CSC842, CSC843, CSC845, CSC899.**
C4	The ability to formulate problems and identify suitable approaches to solving them	**CSC841, CSC842, CSC843, CSC845, CSC899.**
C5	The ability to reason abstractly about the structure and behaviour of computer systems	**CSC812, CSC841, CSC842, CSC843, CSC845.**
D1	Written communication	**CSC812, CSC841, CSC842, CSC843, CSC844, CSC845, CSC899.**
D2	Problem solving	**CSC812, CSC841, CSC842, CSC843, CSC844, CSC845, CSC899.**
D3	Interpersonal communication	**CSC841, CSC842, CSC843, CSC899.**
D4	Initiative	**CSC812, CSC842, CSC845, CSC899.**
D5	Oral presentation	**CSC841, CSC899.**
D6	Adaptability	**CSC812, CSC841, CSC842, CSC845, CSC899.**
D7	Teamwork	**CSC841, CSC843.**
D8	Planning and organisation	**CSC812, CSC841, CSC842, CSC899.**
D9	Computer literacy	**CSC812, CSC842, CSC843, CSC845, CSC899.**

12   Criteria for Admission:

A good honours degree (2ii or equivalent) in any subject. Graduates in Computing Science will also be considered, but will need to be dealt with on an individual basis because of the potential overlap of their first degree with the modules in this MSc.

Admissions policy
Suitable applicants are made an offer without interview as soon as possible after their application forms have been received and considered

Any Additional Requirements
None

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13   Support for Students and their Learning:

Induction
The first week of the first term/semester is an Induction Week with no formal teaching. During this period all students attend an induction programme in which they will be given detailed programme information relating to their course and the timetable of lectures/practicals/labs/ tutorials/etc. In particular all new students will be given general information about the School and their course, as described in the Degree Programme Handbook. The International Office offers an additional induction programme for overseas students (see http://www.ncl.ac.uk/international/coming_to_newcastle/orientation.phtml).

Study skills support
Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Academic support
The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Staff/Student Committee, and/or at the Board of Studies.

Pastoral support
All students are assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees. Details of the personal tutor system can be found at http://www.ncl.ac.uk/undergraduate/support/tutor.phtml . In addition the University offers a range of support services, including the Student Advice Centre, the Student Counselling Service, the Mature Student Support Service, and a Childcare Support Officer, see http://www.ncl.ac.uk/undergraduate/support/welfare.phtml .

Support for Special Needs
Support for students with special needs is provided as required and the University's Disability Support Service can be consulted where appropriate. For further details see http://www.ncl.ac.uk/undergraduate/support/disability.phtml .

Learning resources
The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide

computing facilities, see http://www.ncl.ac.uk/undergraduate/support/acfacilities.phtml .
All new students whose first language is not English are required to take an English Language test in the Language Centre. Where appropriate, in-sessional language training can be provided. The Language Centre houses a range of resources for learning other languages which may be particularly appropriate for those interested in an Erasmus exchanges. See http://www.ncl.ac.uk/undergraduate/support/langcen.phtml
The School of Computing Science has well equipped computer laboratories consisting of networked PCs. Key software used in the support and delivery of the programme is available to students free of charge. The School has its own library which is mainly used for the support of advanced topics and is a particularly valuable resource for individual projects.

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14 Methods for Evaluating and Improving the Quality and standards of Teaching and Learning:

Module reviews
All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the School Teaching and Learning Committee and at the Board of Studies. Student opinion is sought at the Staff/Student Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Teaching and Learning Committee.

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching and Learning Committee.

External examiner reports
External Examiner reports are considered by the Board of Studies under Reserved Business, in the absence of the student representatives. The Board responds to these reports through Faculty Teaching and Learning Committee.

Accreditation reports
Accreditation was sought from the BCS at its visit in November 2003 and subsequently provisionally approved. Masters graduates are entitled to Certificate, Diploma and Diploma Project Exemption.

Student evaluations
All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff/Student Committee, and the Board of Studies.

Feedback mechanisms
 Feedback to students is effected via the Staff/Student Committee and the Board of Studies.

Faculty and University Review Mechanisms
The Programme is subject to the University's Internal Subject Review programme, see http://www.ncl.ac.uk/internal/academic-quality/qualityhome.htm#2 .

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15 Regulation of Assessment:

Pass Marks
The pass mark, as defined in the University's Postgraduate Examination Conventions (http://www.ncl.ac.uk/calendar/university.regs/tpmdeprexamconv.pdf), is 50.

Course Requirements

Progression is subject to the University's Postgraduate Progress Regulations (http://www.ncl.ac.uk/calendar/university.regs/tpmdepr.pdf) and Postgraduate Examination Conventions (http://www.ncl.ac.uk/calendar/university.regs/tpmdeprexamconv.pdf).

Common Marking Scheme
The University employs a common marking scheme, which is specified in the Postgraduate Examination Conventions (http://www.ncl.ac.uk/calendar/university.regs/tpmdeprexamconv.pdf), namely

<50	Fail
50-59	Pass
60-69	Pass with Merit
70+	Pass with Distinction

Role of the External Examiner
An External Examiner, a distinguished member of the subject community, is appointed by Faculty Teaching and Learning Committee, after recommendation from the Board of Studies. The External Examiner is expected to:

- See and approve examination papers
- Moderate examination and coursework marking
- Attend the June/October Board of Examiners
- Report to the University on the standards of the programme

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16   Indicators of Quality and Standards:

Professional Accreditation Reports
The course has been provisionally accredited by the British Computer Society

Internal Review Reports
This programme was covered by the Internal Subject Review of the School of Computing Science held on 28/29th April 2003 and was subsequently approved by Faculty Teaching and Learning Committee and University Teaching and Learning Committee.
The overall judgement was that "The team was impressed by the very positive relationships between the staff and students in the School - it was abundantly clear that the subject group is very student-focused and this was to their significant credit, with students commenting favourably about the approachable nature of the staff as a whole. The overall provision was felt to be excellent, with a significant number of commendations relating to good practice in the School, which others may wish to consider and incorporate into their own procedures."

Previous QAA Reports
Computing Science was adjudged *Satisfactory* in 1994.

This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

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17   Other Sources of Information:

The University Prospectus (see http://www.ncl.ac.uk/postgraduate)

The School Prospectus (see http://www.ncl.ac.uk/undergraduate/subjects/computing)

The University and Degree Programme Regulations (see http://www.ncl.ac.uk/calendar/pdf/uniregs.pdf and http://www.ncl.ac.uk/calendar/sae/)

The Degree Programme Handbook (see http://www.cs.ncl.ac.uk/degrees/pg/compsci/2004compsci.htm)

QAA Subject Review Report