

**PROGRAMME SPECIFICATION**

<b>1</b>	<b>Awarding Institution</b>	Newcastle University
<b>2</b>	<b>Teaching Institution</b>	Newcastle University
<b>3</b>	<b>Final Award</b>	MSc
<b>4</b>	<b>Programme Title</b>	Computing Science
<b>5</b>	<b>Programme Code</b>	5055F, 5055P
<b>6</b>	<b>Programme Accreditation</b>	British Computer Society
<b>7</b>	<b>QAA Subject Benchmark(s)</b>	Computing Science
<b>8</b>	<b>FHEQ Level</b>	Level 7
<b>9</b>	<b>Last updated</b>	16/04/14

**10 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.

**11 Learning Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the benchmark statements for (subject) (X).

**Knowledge and Understanding**

On completing the programme students should 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

<p>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</p>
<p><b>Teaching and Learning Methods</b></p>
<p>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 <i>essential</i>, <i>recommended</i>, and <i>background</i> reading, as well as scientific papers and other learning materials including appropriate web URLs.</p>
<p><b>Assessment Strategy</b></p>
<p>Knowledge and understanding are assessed by means of closed and open book written examinations, and coursework, including group and individual project reports (A1-A6).</p>
<p><b>Intellectual Skills</b></p>
<p>On completing the programme students should be able to demonstrate skills in:</p> <p>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</p>
<p><b>Teaching and Learning Methods</b></p>
<p>B1-B6 feature prominently in all modules. In particular a group project within CSC8005 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).</p>
<p><b>Assessment Strategy</b></p>
<p>B1-B6 feature prominently in all modules. In particular a group project within CSC8005 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).</p>
<p><b>Practical Skills</b></p>
<p>On completing the programme students should be able to:</p> <p>A successful student will have the ability to:</p> <p>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</p>

**Teaching and Learning Methods**

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).

**Transferable/Key Skills**

On completing the programme students should be able to 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 and Learning Methods**

Key skills feature throughout the programme; teamwork in the CSC8005 group project (D7); oral presentation, interpersonal communication, and planning and organisation in the Semester 3 Project module (CSC8099), 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).

## **12 Programme Curriculum, Structure and Features**

### **Basic structure& Key features of the programme (including what makes the programme distinctive)**

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.

### **Programme regulations (link to on-line version)**

<http://www.ncl.ac.uk/regulations/programme/>

## **13 Criteria for admission**

### *Entry qualifications*

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/selection tools*

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

### *Non-standard Entry Requirements*

### *Additional Requirements*

None.

### *Level of English Language capability*

IELTS 6.5 (or equivalent)

## **14 Support for Student Learning**

The Student Services portal provides links to key services and other information and is available at: <http://www.ncl.ac.uk/students/>

### *Induction*

During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/ tutorials/etc. The International Office offers an additional induction programme for overseas students.

### *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, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Numeracy support is available through Maths Aid and help with academic writing is available from the Writing Development Centre (further information is available from the Robinson Library).

#### *Academic and Pastoral support*

Each undergraduate and taught postgraduate student will be assigned a personal tutor.\* A personal tutor is one part of a wider network of advice and guidance available to students to support their personal and general academic development. The module leader acts as the first point of contact for subject-specific academic advice. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Student-Staff Committee, and/or at the Board of Studies. Within the academic unit, students may also receive additional academic and pastoral advice from a range of other student-facing staff including degree programme directors, dissertation/project supervisors, and administrative support staff.

\*Arrangements may vary for students taking special types of provision.

The University also offers a wide range of institutional services and support upon which students can call, such as the Writing Development Centre, Careers Service and Student Wellbeing Service. This includes one-to-one counselling and guidance or group sessions / workshops on a range of topics, such as emotional issues e.g. stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Student Union operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

#### *Support for students with disabilities*

The University's Disability Support team provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies.

#### *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.

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.

All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-session language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange.

### **15 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 Board of Studies and/or the School Teaching and Learning Committee. Student opinion is sought at the Student-Staff Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Learning, Teaching and Student Experience Committee.

#### *Programme reviews*

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Learning, Teaching and Student Experience Committee. The FLTSEC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the Faculty Learning, Teaching and Student Experience Committee.

#### *External Examiner reports*

External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Learning, Teaching and Student Experience Committee. External Examiner reports are shared with institutional student representatives, through the Student-Staff Committee.

#### *Student evaluations*

All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Student-Staff Committee, and the Board of Studies. The results from student surveys are considered as part of the Annual Monitoring and Review of the programme and any arising actions are captured at programme and School / institutional level and reported to the appropriate body.

#### *Mechanisms for gaining student feedback*

Feedback is channelled via the Student-Staff Committee and the Board of Studies.

#### *Faculty and University Review Mechanisms*

Every six years degree programmes in each subject area undergo periodic review. This involves both the detailed consideration of a range of documentation, and a review visit by a review team (normally one day in duration) which includes an external subject specialist and a student representative. Following the review a report is produced, which forms the basis for a decision by University Learning, Teaching and Student Experience Committee on whether the programmes reviewed should be re-approved for a further six year period.

#### *Accreditation reports*

#### *Additional mechanisms*

## **16 Regulation of assessment**

#### *Pass mark*

The pass mark is 50%

#### *Course requirements*

Progression is subject to the University's Masters Degree Progress Regulations, Taught and Research and Examination Conventions for Taught Masters Degrees. There are reassessment opportunities, with certain restrictions.

Where the regulations included in this document differ from other University regulations, the regulations included here take precedence. Progression is subject to the University's Taught Postgraduate Master's Degree Progress Regulations and Taught Postgraduate Master's Degree Examination Conventions.

The University employs a common marking scheme, which is specified in the Taught Postgraduate Examination Conventions, namely:

**Summary description applicable to postgraduate Masters programmes**

**Summary description applicable to postgraduate Certificate and Diploma programmes**

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

*Award of the MSc degree in Computing Science*

To obtain the MSc degree, candidates must satisfy the examiners in the two assessed components:

Component 1: The first and second semester taught modules (120 credits).

Component 2: 60-credit individual project with dissertation module.

A student will be recommended for the *award of MSc with Distinction* if at the first attempt they have achieved a pass mark in 160 credits with a weighted average mark across all 180 credits of at least 70 and have a component 2 mark of at least 70.

A student will be recommended for the *award of MSc with Merit* if at the first attempt they have achieved a pass mark in 160 credits with a weighted average mark across all 180 credits of at least 60 and have a component 2 mark of at least 60.

A student will be recommended for the *award of MSc* if they have achieved a pass mark in 160 credits with a weighted average mark across all 180 credits of at least 50.

*Role of the External Examiner*

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

- i. See and approve assessment papers
- ii. Moderate examination and coursework marking
- iii. Attend the Board of Examiners
- iv. Report to the University on the standards of the programme

In addition, information relating to the programme is provided in:

The University Prospectus: <http://www.ncl.ac.uk/postgraduate/>

The School Brochure: <http://www.ncl.ac.uk/computing/>

Degree Programme and University Regulations: <http://www.ncl.ac.uk/regulations/docs/>

Please note. 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.

### Mapping of Intended Learning Outcomes onto Curriculum/Modules

<b>Intended Learning Outcome</b>	<b>Module codes (Compulsory in Bold)</b>
A1 A good knowledge of a high level programming language	<b>CSC8001, CSC8002, CSC8005, CSC8008.</b>
A2 A number of applications within Computing Science	<b>CSC8001, CSC8002, CSC8005, CSC8004, CSC8008, CSC8010.</b>
A3 The principles of software engineering	<b>CSC8001, CSC8002, CSC8005.</b>
A4 Techniques for the development of algorithms for a range of applications	<b>CSC8001, CSC8002, CSC8005, CSC8008.</b>
A5 Computer organisation and architectures	<b>CSC8004, CSC8010.</b>
A6 Professional issues to cover: social, ethical and legal aspects	<b>CSC8005, CSC8009, CSC8010.</b>
A7 Some of the theoretical foundations of Computing Science	<b>CSC8002, CSC8010.</b>
B1 The process of software development	<b>CSC8001, CSC8002, CSC8005.</b>
B2 The use of hardware and software systems	<b>CSC8001, CSC8002, CSC8010.</b>
B3 The identification and implementation of appropriate algorithms and data structures	<b>CSC8001, CSC8002, CSC8005.</b>
B4 The use and provision of network information services	<b>CSC8001, CSC8002, CSC8004, CSC8008.</b>
B5 The use of programming languages	<b>CSC8001, CSC8002, CSC8008.</b>
C1 The ability to conduct investigations using the technical and professional literature	<b>CSC8001, CSC8005, CSC8009, CSC8099.</b>
C2 The ability to use and evaluate appropriate tools and techniques	<b>CSC8001, CSC8002, CSC8005, CSC8009, CSC8099.</b>
C3 The ability to undertake critical evaluation (both theoretical and empirical) of alternative solutions	<b>CSC8004, CSC8010, CSC8009, CSC8099.</b>
C4 The ability to formulate problems and identify suitable approaches to solving them	<b>CSC8002, CSC8009, CSC8008, CSC8099.</b>
C5 The ability to reason abstractly about the structure and behaviour of computer systems	<b>CSC8001, CSC8002, CSC8005, CSC8004.</b>
D1 Written communication	<b>CSC8001, CSC8002, CSC8009, CSC8004, CSC8005, CSC8099.</b>
D2 Problem solving	<b>CSC8001, CSC8002, CSC8008, CSC8005, CSC8004, CSC8009, CSC8099.</b>
D3 Interpersonal communication	<b>CSC8005, CSC8009, CSC8099.</b>
D4 Initiative	<b>CSC8001, CSC8002, CSC8009, CSC8099.</b>



D5 Oral presentation	<b>CSC8005, CSC8099.</b>
D6 Adaptability	<b>CSC8001, CSC8002, CSC8005, CSC8009, CSC8099.</b>
D7 Teamwork	<b>CSC8005.</b>
D8 Planning and organisation	<b>CSC8001, CSC8002, CSC8005, CSC8009, CSC8099.</b>
D9 Computer literacy	<b>CSC8001, CSC8002, CSC8005, CSC8009, CSC8099.</b>