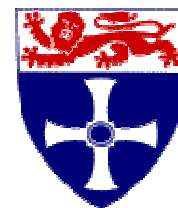


UNIVERSITY OF
NEWCASTLE UPON TYNE

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	BSc (Hons)
4. Programme Title	Computing Science (JH component)
5. Programme Accredited by:	N/A
6. UCAS Code	NG4K, GL4C, GG95, GG41, FG34, CG8K, GG34, GH4F
7. QAA Benchmarking Group(s)	Computing
8. Date of production/revision	29/9/04

9. Programme Aims:

The aims of this programme are a subset of those for the Single Honours Degree in Computing Science. As such, students will have less breadth, but they will be able to follow some topics in depth.

- To produce graduates who will have a clear understanding of the practical, theoretical and professional foundations of Computing Science. They will be able to apply relevant theory to the solution of practical problems and to the analysis of existing algorithms and techniques, and to recommend techniques and algorithms appropriate to specific circumstances in the areas of fundamental systems and major applications. They will also be able to develop and evaluate new algorithms and techniques in these areas. They will understand the principles of large scale software implementation but will not have extensive experience in that area. We envisage graduates going on to employment in technical positions in software houses and with large-scale scientific and engineering users; some graduates may also seek to pursue research careers.
- To provide a programme which meets the FHEQ at Honours level and which takes appropriate account of the 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 range of programming paradigms and languages
- A2. A number of applications within Computing Science
- A3. The principles of software engineering
- A4. The theoretical and mathematical foundations of Computing Science
- A5. Techniques for the development of algorithms for a range of applications
- A6. Computing organisation and architectures

Teaching & Learning Strategy

Lectures are the main way of imparting knowledge and understanding (A1-A6), but tutorials are also used. Practical classes feature prominently, especially to support the Stage 1 programming 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, (A1-A6).

B Subject-specific/professional skills

A successful student will be able to understand and undertake:

- B1. The process of software development
- B2. The use of hardware and software systems
- B3. The application of theoretical concepts of computing science in the design and analysis of systems and algorithms
- B4. The identification and implementation of appropriate algorithms and data structures
- B5. The use and provision of network information services
- B6. The use of a variety of programming languages and paradigms
- B7. Analysis of system requirements and the production of system specifications

Teaching & Learning Strategy

B1-B7 feature prominently in all modules, where coursework is used to develop these skills.

Assessment strategy

Subject-specific and professional skills are assessed by coursework (B1-B7).

C Cognitive skills

A successful student will have:

- C1. The ability to conduct investigations using the technical and professional literature
- C2. The ability to use and evaluate appropriate tools and techniques
- C3. The ability to undertake empirical evaluation of alternative solutions
- C4. The ability to formulate problems and identify suitable approaches to solving them
- C5. The ability to reason abstractly about the structure and behaviour of computer systems

Teaching & Learning Strategy

All modules involve coursework, much of which involves problem solving skills (C4), 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 able to use the following skills:

- D1. Written communication
- D2. Problem solving
- D3. Interpersonal communication
- D4. Initiative
- D5. Oral presentation
- D6. Adaptability
- D7. Teamwork
- D8. Numeracy
- D9. Planning and organisation
- D10. Computer literacy

Teaching & Learning Strategy

Key skills feature throughout the programme (D1-D10); in particular, written communication in all modules (D1); numeracy is covered by exercises in the programming modules (D8); computer literacy, problem solving, initiative and adaptability are necessarily covered throughout the programme (D2, D4, D6, D10).

Assessment strategy

Key (transferable) skills are assessed by both written and oral presentations (D1-D10).

11 Programme Features, Structure and Curriculum

A & B Programme Features & Structure

Students study 60 credits of compulsory modules in Stages 1 and 2, and choose from a range of optional modules at Stage 3.

The following combinations of subjects (followed by their UCAS Codes) are permitted:

Accounting and	Computing Science	NG4K
Computing Science and	Economics	GL4C
	Mathematics	GG41
	Physics	FG34
	Psychology	CG8K
	Statistics	GG34
	Surveying and Mapping Science	GH4F
Geographic Information Science and Computing Science		GG95

C Programme Curriculum

Stage 1

(a) All candidates shall select, subject to the approval of the Degree Programme Director, modules to a total value of at least 40 credits from each of the subjects of the degree; these will be regarded as core modules. The choice of modules available in each subject is set out in the relevant Degree Programme Handbook. For Computing Science these are:

<i>Code</i>	<i>Credits</i>	<i>Descriptive title</i>
CSC161 (20)		Problem Solving, Program Design and Implementation
CSC162 (20)		Object-Oriented Program Design and Development
CSC166 (20)		Computer Environments

(b) All candidates shall select, subject to the approval of the Degree Programme Director, further modules with a total value of 40 credits.

Note: a list of the Stage 0 and Stage 1 modules offered by other schools in the Faculty will be found in the List of Modules given in the University Regulations at www.ncl.ac.uk/regulations on the World Wide Web. Candidates may also, in certain circumstances, be given permission by the Degree Programme Director to study modules offered by schools in other faculties.

Stage 2

(a) All Stage 2 modules are Honours modules.

(b) Subject to the approval of the Degree Programme Director for the relevant Honours programmes, all candidates shall select modules to a total value of 60 credits in each subject of the degree. The choice of modules available in each subject is set out in the relevant Degree Programme Handbook. For Computing Science these are:

<i>Code</i>	<i>Credits</i>	<i>Descriptive title</i>
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CSC261 (20)	Advanced Programming
CSC262 (20)	Requirements Analysis and Database Design
CSC266 (20)	Algorithm Design and Analysis

Note: the Degree Programme Director for the Joint Honours degree may, where appropriate, permit a candidate to substitute modules up to the value of 20 credits offered by another school.

Stage 3

(a) All Stage 3 modules are Honours modules.

(b) Subject to the approval of the Degree Programme Director for the relevant Honours programmes, all candidates shall select modules to a total value of 60 credits in each subject of the degree. The choice of modules available in each subject is set out in the relevant Degree Programme Handbook. For Computing Science these are:

Code Credits Descriptive title

CSC304 (10)	Applications of Artificial Intelligence
CSC305 (10)	Parallel Computation
CSC306 (10)	Graphics
CSC307 (10)	Human-Computer Interaction
CSC308 (10)	Software Project Management
CSC309 (10)	Distributed Systems
CSC310 (10)	Real-time Systems
CSC311 (10)	Reliability and Fault Tolerance
CSC331 (10)	System and Network Security
CSC332 (10)	Internet Technologies and Electronic Commerce
CSC334 (10)	Understanding Programming Languages
CSC335 (10)	Performance Evaluation
CSC337 (10)	Computer Games Development
CSC338 (10)	Evolution of Complex Systems

Note: the Degree Programme Director for the Joint Honours degree may, where appropriate, permit a candidate to substitute modules up to the value of 20 credits either by modules offered by another school.

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

A1. A range of programming paradigms and languages	CSC161, CSC162, CSC166, CSC261, CSC262, CSC305, CSC309, CSC332, CSC334, CSC335, CSC337.
A2. A number of applications within Computing Science	CSC166, CSC262, CSC266, CSC305, CSC335, CSC337, CSC338.
A3. The principles of software engineering	CSC161, CSC162, CSC261, CSC262, CSC266, CSC306,

	<i>CSC307, CSC308, CSC310, CSC311, CSC335 CSC337.</i>
A4. The theoretical and mathematical foundations of Computing Science	CSC166, CSC262, CSC266, <i>CSC305, CSC306, CSC309, CSC310, CSC334, CSC335.</i>
A5. Techniques for the development of algorithms for a range of applications	CSC161, CSC162, CSC261, CSC262, CSC266, <i>CSC305, CSC306, CSC309, CSC311, CSC335, CSC338.</i>
A6. Computing organisation and architectures	CSC161, CSC166, <i>CSC305, CSC307, CSC310, CSC311, CSC335.</i>
B1. The process of software development	CSC161, CSC162, CSC166, CSC261, CSC262, <i>CSC301, CSC305, CSC306, CSC308, CSC311, CSC332, CSC334, CSC335, CSC337.</i>
B2. The use of hardware and software systems	CSC161, CSC166, CSC261, CSC262, <i>CSC305, CSC310, CSC311, CSC332, CSC337.</i>
B3. The application of theoretical concepts of computing science in the design and analysis of systems and algorithms	CSC162, CSC166, CSC266, <i>CSC305, CSC306, CSC307, CSC310, CSC334, CSC335.</i>
B4. The identification and implementation of appropriate algorithms and data structures	CSC161, CSC162, CSC261, CSC266, <i>CSC305, CSC306, CSC310, CSC311, CSC332, CSC335, CSC337.</i>
B5. The use and provision of network information services	CSC161, CSC166, CSC262, <i>CSC307, CSC309, CSC332, CSC337.</i>
B6. The use of a variety of programming languages and paradigms	CSC166, CSC261, <i>CSC305, CSC331, CSC332, CSC335.</i>
B7. Analysis of system requirements and the production of system specifications	CSC162, CSC166, CSC262, <i>CSC307, CSC335, CSC337.</i>
C1. The ability to conduct investigations using the technical and professional literature	CSC166, CSC262, <i>CSC305, CSC306, CSC307, CSC310, CSC311, CSC331, CSC332, CSC335, CSC337, CSC338.</i>
C2. The ability to use and evaluate appropriate tools and techniques	CSC162, CSC166, CSC261, CSC262, CSC266, <i>CSC305, CSC306, CSC307, CSC309, CSC331, CSC332, CSC334, CSC335, CSC337, CSC338.</i>
C3. The ability to undertake empirical evaluation of alternative solutions	CSC161, CSC162, CSC166, CSC261, CSC262, CSC266, <i>CSC305, CSC306, CSC307, CSC331, CSC332, CSC335, CSC337, CSC338.</i>
C4. The ability to formulate problems and identify suitable approaches to solving them	CSC161, CSC162, CSC166, CSC261, CSC262, CSC266, <i>CSC305, CSC306, CSC307, CSC309, CSC311, CSC331, CSC332, CSC335, CSC337, CSC338.</i>
C5. The ability to reason abstractly about the structure and behaviour of computer systems	CSC261, CSC262, CSC266, <i>CSC311, CSC332, CSC334, CSC335, CSC337, CSC338.</i>

D1. Written communication	CSC161, CSC162, CSC166, CSC262, CSC305, CSC306, CSC307, CSC308, CSC310, CSC311, CSC335, CSC337, CSC338.
D2. Problem solving	CSC161, CSC162, CSC166, CSC261, CSC262, CSC266, CSC305, CSC306, CSC307, CSC309, CSC310, CSC311, CSC331, CSC332, CSC334, CSC335, CSC337, CSC338.
D3. Interpersonal communication	CSC307, CSC308, CSC334, CSC338.
D4. Initiative	CSC162, CSC166, CSC262, CSC305, CSC306, CSC307, CSC311, CSC331, CSC334, CSC335, CSC337, CSC338.
D5. Oral presentation	CSC307, CSC338.
D6. Adaptability	CSC162, CSC166, CSC266, CSC305, CSC307, CSC331, CSC335, CSC337, CSC338.
D7. Teamwork	CSC307, CSC308, CSC334, CSC338.
D8. Numeracy	CSC266, CSC305, CSC306, CSC307, CSC331, CSC335, CSC337.
D9. Planning and organisation	CSC161, CSC162, CSC166, CSC262, CSC305, CSC306, CSC307, CSC308, CSC310, CSC335, CSC337, CSC338.
D10. Computer literacy	CSC161, CSC162, CSC166, CSC262, CSC266, CSC305, CSC306, CSC307, CSC311, CSC332, CSC335, CSC337.

12 Criteria for Admission:

A-Level Subjects and Grades

This varies according to particular JH combination, but typically BBB at A2 to include Mathematics.

Alternative entry qualifications

We accept a wide range of alternative qualifications, as long as they are supported by an A2 pass at Mathematics (or equivalent).

Admissions policy

Applications are considered by the Degree Programme Director for the Joint Honours degree. Suitable applicants are usually made an offer without interview as soon as possible after their application forms have been received and considered. In some cases, however, e.g. where an applicant has non-standard qualifications, an interview may be necessary before a decision is made. Applicants are invited to a JH Visit Day, during which they are able to visit the relevant Schools to see the University and to meet staff and current undergraduates on the programme. Attendance is strongly encouraged but not compulsory and applicants who are not based in the UK are not expected to attend.

Arrangements for non-standard entrants

Potential students are interviewed either in person or over the phone to assess their suitability for the programme.

Any Additional Requirements

None

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 Stage 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, e.g. time management is covered in the appropriate Induction Programme.

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 with dedicated labs for each stage of the programme. 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 in the later stages of the programme. The University's Robinson Library has available multiple copies of all recommended undergraduate texts.

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. For JH programmes the External Examiner for each half reports to the JH Board of Examiners where an External Assessor oversees the process.

Accreditation reports

This programme is not accredited by any professional body.

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>.

15 Regulation of Assessment:

Pass Marks

The pass mark, as defined in the University's Undergraduate Examination Conventions (<http://www.ncl.ac.uk/calendar/university.regs/ugexamconv.pdf>), is 40.

Course Requirements

Progression is subject to the University's Undergraduate Progress Regulations (<http://www.ncl.ac.uk/calendar/university.regs/ugcont.pdf>) and Undergraduate Examination Conventions (<http://www.ncl.ac.uk/calendar/university.regs/ugexamconv.pdf>). In summary, students must pass 120 credits at each Stage. Limited compensation down to 35 is possible at each Stage and there are resit opportunities, with certain restrictions.

Weighting of Stages

Modules taken at Stages 2 and 3 are Honours modules and the two stages contribute to the award of the final degree in the ratio 50:50.

Common Marking Scheme

The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions (<http://www.ncl.ac.uk/calendar/university.regs/ugcont.pdf>), namely

	Honours	Non-honours
<40	Fail	Failing
40-49	Third Class	Basic
50-59	Second Class, Second Division	Good
60-69	Second Class, First Division	Very Good
70+	First Class	Excellent

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 Board of Examiners
- Report to the University on the standards of the programme

16 Indicators of Quality and Standards:

Professional Accreditation Reports
Not applicable

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.

17 Other Sources of Information:

The University Prospectus (see <http://www.ncl.ac.uk/undergraduate/>)

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 Handbooks

QAA Subject Review Report