	PROGRAMME SPECIFICATION	Newcastle University

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	BSc (Hons)
4	**Programme Title**	Computing Science
5	**UCAS/Programme Code**	NG4K Accounting and Computing Science , GL4C Computing Science and Economics, GG41 Computing Science and Mathematics,
6	**Programme Accreditation**	N/A
7	**QAA Subject Benchmark(s)**	Computing
8	**FHEQ Level**	Level 6
9	**Date written/revised**	February 2011

10	**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.

1. To produce graduates with the knowledge and skills necessary to exploit computing systems throughout their professional life. Graduates will have an understanding of the practical and theoretical foundations of Computing Science. They will have knowledge and experience of the fundamental techniques used in modern software engineering. 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 appreciate, develop and evaluate new algorithms, techniques and other developments within the computing field.

2. To provide a programme which meets the FHEQ at Honours level and which takes appropriate account of the 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 Computing.

Knowledge and Understanding

On completing the programme students should be able to demonstrate knowledge and understanding of:
A1. A diverse range of programming paradigms and languages supported by programming language principles
A2. The principles of software engineering
A3. The theoretical and mathematical foundations of Computing Science
A4. Techniques for the development of data representations and algorithms
A5. Computer and network organisation

A student will additionally have gained and be able to demonstrate knowledge and understanding of the following, depending on the options taken at Stage 3:
A6. Technological foundations of computer graphics systems
A7. The mathematical principles and algorithmic basis of computer graphics

A8. Design issues and development techniques for computer graphics, games and virtual environments
A9. Human requirements and technical capabilities of modern virtual environments, games and graphics platforms
A10. Fundamental problems and approaches in artificial intelligence, as applied to computer games, visualisation and virtual environments

Teaching and Learning Methods

Lectures are the main way of imparting knowledge and understanding (A1-A10), but tutorials are also used. Practical classes feature prominently, especially to support the Stage 1 programming modules (A1, A2). 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-A10).

Intellectual Skills

On completing the programme students should have skills in the areas of:
B1. Carrying out the process of software development, including: the analysis of system requirements; the production of system specifications using appropriate models and techniques; software validation and verification
B2. The use of a variety of advanced (especially object-oriented) programming languages and paradigms
B3. The use of a variety of computer-based (including operating) systems
B4. The application of theoretical concepts of computing science in the design and analysis of systems and algorithms
B5. The identification and implementation of appropriate algorithms and data structures
B6. The use and provision of network information services

A student may have skills in the following areas depending on the options taken at Stage 3
B7. Development and/or implementation of graphics algorithms and applications in standard software environments.
B8. Modelling, rendering and interaction in 3D graphical environments
B9. Mathematical techniques for the manipulation of 3D geometry
B10. Implementation of artificial intelligence algorithms in a declarative programming language

Teaching and Learning Methods

B1-B6 feature prominently in all modules. In all modules coursework is used to develop these skills (B1-B10).

Assessment Strategy

Subject-specific and professional skills are assessed by coursework (B1-B10).

Practical Skills

On completing the programme students should 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 solve problems by identifying suitable approaches using computer-based systems
C5. The ability to reason abstractly about the structure and behaviour of computer systems

Teaching and Learning Methods

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

Practical 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 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 and Learning Methods

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 written presentations (D1-D10).

12	Programme Curriculum, Structure and Features

Basic structure of the programme

Students study 60 credits of compulsory modules in Stages 1 and 2, and choose from a range of optional modules at Stage 3. Students study 120 credits in total at each Stage.

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

Accounting and	Computing Science	NG4K
Computing Science and	Economics	GL4C
	Mathematics	GG41
	Statistics	GG34

Key features of the programme (including what makes the programme distinctive)

Students are able to combine the study of Computing Science with another subject.

Programme regulations (link to on-line version)

http://www.ncl.ac.uk/calendar/sae/faculty.html?faculty=SAE

13	Criteria for admission

Dealt with in overarching Joint Honours Programme Specification.

14	Support for Student Learning

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 (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 this 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.

Help with academic writing is available from the Writing Centre.

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 Counselling and Wellbeing team, the Mature Student Support Officer, and a Childcare Support Officer, see http://www.ncl.ac.uk/undergraduate/support/welfare.phtml

Support for students with disabilities
The University's Disability Support Service 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. For further details see http://www.ncl.ac.uk/disability-support/

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

The School of Computing Science has well equipped computer laboratories consisting of networked PCs with dedicated labs for each stage of the programme. In particular the School hosts a videoconferencing suite, funded through the HEFCE Centre of Excellence in Teaching and Learning 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.

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-sessional 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

Joint Honours programmes are subject to review by the subject specific Board of Studies and Staff Student Committee as well as the Board of Studies for Co- and Multidisciplinary Programmes and its associated Staff Student Committee.

Module reviews
All modules are subject to review by questionnaires which are considered by the CS Staff Student Committee and the CS Board of Studies. Changes to, or the introduction of new, modules are considered at the School Teaching and Learning Committee and at the Boards of Studies. Student opinion is sought at the Staff Student Committees and/or the Boards 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 for Co- and Multidisciplinary Programmes 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 CS Board of Studies. External Assessor reports are considered by the Board of Studies for Co- and Multidisciplinary Programmes. The Boards respond to these reports through Faculty Teaching and Learning Committee.

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 Committees, and the Boards of Studies. The National Student Survey is sent out every year to final-year undergraduate students, and consists of a set of questions seeking the students' views on the quality of the learning and teaching in their HEIs. Further information is at www.thestudentsurvey.com/ With reference to the outcomes of the NSS and institutional student satisfaction surveys actions are taken at all appropriate levels by the institution.

Mechanisms for gaining student feedback
Feedback is channelled via the Staff Student Committees and the Boards of Studies.

Faculty and University Review Mechanisms
The programme is subject to the University's Internal Subject Review process, see
http://www.ncl.ac.uk/aqss/qsh/internal_subject_review/index.php

Accreditation reports
This programme is not accredited by any professional body.

Additional mechanisms

Board of Studies annual report
Peer observation of teaching
Annual module review
Annual review of progression rates
Joint Honours questionnaires
Joint Honours Staff Student Committee

Committees with responsibility for monitoring and evaluating quality and standards

Board of Studies in Accounting and Finance
Joint Honours Board of Studies
Teaching and Learning Committee in the University of Newcastle upon Tyne Business School
Employers' Panel
Stream Review meetings in Accounting and Finance
Examination Boards

16   Regulation of assessment

Pass mark
The pass mark is 40.

Course requirements
Progression is subject to the University's Undergraduate Progress Regulations and Undergraduate Examination Conventions. In summary, students must pass, or be deemed to have passed, 120 credits at each Stage. Limited compensation up to 40 credits and down to a mark of 35 is possible at each Stage and there are resit opportunities, with certain restrictions.

Weighting of stages
The marks from Stages 2 and 3 will contribute to the final classification of the degree
The weighting of marks contributing to the degree for Stages 2 and 3 is 1:1.

Common Marking Scheme
The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions, namely

	Modules used for degree classification	Modules not used for degree classification
<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 CS Board of Studies. The External Examiner is expected to:
    See and approve examination papers
    Moderate examination and coursework marking
    Attend the Board of Examiners
    Report to the University on the standards of the programme

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

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

The School Brochure (contact enquiries@ncl.ac.uk)

The University Regulations (see http://www.ncl.ac.uk/calendar/university.regs/)

The Degree Programme Handbook
(see http://www.cs.ncl.ac.uk/teaching/undergraduate/index.php)

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

Intended Learning Outcome	Module codes (Compulsory in Bold)
A1	**, CSC2011, ,** CSC3004, CSC3202.
A2	**, CSC2011, , CSC2016**, CSC3003, CSC3002, CSC3201, CSC3202.
A3	**, CSC2012, CSC2016,** CSC3004, CSC3201.
A4	**, CSC2011, , CSC2016,** CSC3002, CSC3201.
A5	, CSC3002, CSC3003.
A6	CSC3201, CSC3202, CSC3204.
A7	CSC3201, CSC3202, CSC3204.
A8	CSC3202, CSC3203, CSC3204.
A9	CSC3201, CSC3202, CSC3204.
A10	CSC3203, CSC3204.
B1	**, CSC2011, ,** CSC3003, CSC3002, CSC3004, CSC3201, CSC3202.
B2	**, CSC2011.**
B3	**, CSC2011, ,** CSC3002, CSC3202.
B4	**, , CSC2016,** CSC3003, CSC3004, CSC3201.
B5	**, CSC2011, CSC2016,** CSC3002, CSC3201, CSC3202.
B6	, , CSC3003, CSC3202.
B7	CSC3201, CSC3202, CSC3204.
B8	CSC3201, CSC3202, CSC3204.
B9	CSC3201, CSC3202, CSC3204.
B10	CSC3203.
C1	**, CSC2012,** CSC3003, CSC3002, ,CSC3201, CSC3202.
C2	**, CSC2011, , CSC2016,** CSC3003, CSC3004, CSC3201, CSC3202,
C3	**, CSC2011, , CSC2016,** CSC3003, CSC3202, , CSC3201,
C4	**, CSC2011, , CSC2016,** CSC3002, CSC3003, , CSC3201, CSC3202.
C5	**CSC2011, , CSC2016,** CSC3002, CSC3004, , CSC3202.
D1	, , CSC3002, CSC3003, CSC3201, CSC3202.
D2	**, CSC2011, , CSC2016,** CSC3002, CSC3004, , CSC3201, CSC3202,
D3	CSC3004, CSC3006.
D4	, CSC3003, CSC3004, CSC3201, CSC3202.
D5	
D6	**, CSC2016,** , CSC3202.
D7	CSC3004,.
D8	**CSC2016,** CSC3202, CSC3201.
D9	, CSC3003, , CSC3201, CSC3202.
D10	**, CSC2016**, CSC3002, CSC3003, CSC3201, CSC3202.

Core module to add CSC2013 Optional module to add CSC3503