

PROGRAMME SPECIFICATION



1	Awarding Institution	Newcastle University
2	Teaching Institution	Newcastle University
3	Final Award	BSc (Hons)
4	Programme Title	Computing Science and Mathematics
5	UCAS/Programme Code	GG41
6	Programme Accreditation	N/A
7	QAA Subject Benchmark(s)	Computing
8	FHEQ Level	Honours
9	Date written/revised	August 2013

10 Programme Aims

This specification for component subject in a Joint Honours in Science Programme must be read in conjunction with the over-arching Joint Honours Programme Specification and one other component subject specification in combinations as outlined above.

The component subject of Computing Science aims to:

1. To produce graduates with the in-depth knowledge and skills necessary to exploit computing systems throughout their professional life. Graduates will have a clear understanding of the practical, theoretical and professional foundations of key computing science topics. They will be able to apply relevant theory to the solution of practical problems, to the analysis of existing algorithms and techniques and development of applications of IT, building on standard software and hardware platforms
2. To provide a programme that equips students with subject-specific and transferable skills that will enable them to pursue a variety of careers within, and outside, the IT industry, including research.
3. 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. The following identifies the generic Intended Learning Outcomes. There will be variation depending on the options taken at Stage 3.

Knowledge and Understanding

On completing the programme students should have gained and 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. Professional issues, including legal and ethical aspects of professional practice, professional development, social roles and effects of computing systems

<p>A4. Communicating information</p> <p>A5. Techniques for distributed and Internet programming</p> <p>A6. Advanced knowledge of modern software engineering processes</p> <p>A7. Knowledge of basic principles of advanced software CASE tools</p> <p>A8. Awareness of software project management techniques</p> <p>A9. Understanding of legal issues affecting software projects</p>
Teaching and Learning Methods
<p>Lectures are the main way of imparting knowledge and understanding (A1-A9), but tutorials are also used. Practical classes feature prominently, especially to support the Stage 1 programming modules (A1, A2). Visiting speakers provide seminars on aspects of being an IT professional (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. In addition, an industrial placement will involve the development of knowledge within an industrial setting.</p>
Assessment Strategy
<p>Knowledge and understanding are assessed by means of closed and open book written examinations, and coursework, including team and individual project reports and log books (A1-A9).</p>
Intellectual Skills
<p>On completing the programme students should be able to understand and undertake:</p> <p>B1. Carrying out the process of software development, including: the analysis of system requirements: the production of system specifications using appropriate models and techniques</p> <p>B2. The use of a variety of advanced computer-based (including operating) systems</p> <p>B3. The use and provision of network information services</p> <p>B4. The use of a variety of programming languages and paradigms</p> <p>B5. The design and implementation of user interfaces</p> <p>B6. The introduction, customization and management of IT systems</p> <p>B7. Giving advice and support to users in the operation of their IT systems</p> <p>B8. Project management skills, including estimation and planning</p> <p>B9. The application of IT systems to other subject areas depending on specialism</p> <p>B10. Designing and building realistic distributed systems and Internet applications</p> <p>B11. Integration of a wide variety of protocols and platforms</p>
Teaching and Learning Methods
<p>Coursework is used to develop many of these skills (B1-B11).</p>
Assessment Strategy
<p>Subject-specific and professional skills are assessed by coursework (B1-B11).</p>

Practical Skills
<p>On completing the programme students will have:</p> <p>C1. The ability to conduct investigations using the technical and professional literature</p> <p>C2. The ability to use and evaluate appropriate tools and techniques</p> <p>C3. The ability to undertake empirical evaluation of alternative solutions</p> <p>C4. The ability to solve problems by identifying suitable approaches to using computer-based systems.</p>
Teaching and Learning Methods
<p>All modules involve coursework, much of which involves problem solving skills (C4). This is especially so in 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).</p>
Assessment Strategy
<p>Practical skills are assessed by a range of coursework (reports, design documents, etc.) (C1-C4).</p>
Transferable/Key Skills
<p>On completing the programme students should be able to use the following skills:</p> <p>D1. Written communication</p> <p>D2. Problem solving</p> <p>D3. Interpersonal communication</p> <p>D4. Initiative</p> <p>D5. Adaptability</p> <p>D6. Teamwork</p> <p>D7. Numeracy</p> <p>D8. Planning and organisation</p> <p>D9. Computer literacy</p>
Teaching and Learning Methods
<p>Key skills feature throughout the programme; all students will have a basic level of numeracy (at least a C in GCSE Maths) and these skills are used and developed by exercises in the programming modules; computer literacy, problem solving, initiative and adaptability are necessarily covered throughout the programme.</p>
Assessment Strategy
<p>Key (transferable) skills are assessed by written presentations (D1-D9). Some skills are extensively practised but not easily assessed</p>

12 Programme Curriculum, Structure and Features
Basic structure of the programme
<p>This component is 50% of a three-year full-time programme.</p> <p>Modules at Stage 1 and 1 provide strong foundation in the key knowledge and understanding and the practical skills required for a career in computing and/or information systems. Stage 3 allows for specialisation and for students to match their optional choices with their other subject area</p>

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

The programme integrates learning through lectures and in practical sessions to develop both underpinning knowledge together with the skills needed by IT professionals.
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Programme regulations (link to on-line version)
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http://www.ncl.ac.uk/regulations/programme/

13 Criteria for admission

Presented in overarching Joint Honours Programme Specification.

14 Support for Student Learning
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Presented in overarching Joint Honours Programme Specification.

15 Methods for evaluating and improving the quality and standards of teaching and learning

<i>Module reviews</i>

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 Student-Staff 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.

Integration at Programme level is presented in the overarching Joint Honours Programme Specification.

16 Regulation of assessment

Presented in overarching Joint Honours Programme Specification.

In addition, information relating to the programme is provided in:
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The University Prospectus: http://www.ncl.ac.uk/undergraduate/
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The School Brochure: enquiries@ncl.ac.uk)

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

The Degree Programme Handbook:

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.
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Mapping of Intended Learning Outcomes onto Curriculum/Modules

Compulsory modules are indicated in bold

Intended Learning Outcome	Description	Module codes (Compulsory in Bold)
A1	A diverse range of programming paradigms and languages supported by programming language principles	CSC3501 , CSC3504
A2	The principles of software engineering	CSC3002 , CSC3003 , CSC3303
A3	Professional issues, including legal and ethical aspects of professional practice, professional development, social roles and effects of computing systems	CSC3003 , CSC3303, CSC3501, CSC3504
A4	Communicating information	CSC3003 , CSC3501 CSC3504,
A5	Techniques for distributed and Internet programming	CSC3504
A6	Advanced knowledge of modern software engineering processes	CSC3303
A7	Knowledge of basic principles of advanced software CASE tools	CSC3303
A8	Awareness of software project management techniques	CSC3303
A9	Understanding of legal issues affecting software projects	CSC3303
B1	Carrying out the process of software development, including: the analysis of system requirements: the production of system specifications using appropriate models and techniques	CSC3002 , CSC3303 , CSC3504
B2	The use of a variety of advanced computer-based (including operating) systems	CSC3002 , CSC3501 , CSC3503, CSC3504
B3	The use and provision of network information services	CSC3003 , CSC3501 , CSC3504,
B4	The use of a variety of programming languages and paradigms	CSC3501 , CSC3504
B5	The design and implementation of user interfaces	CSC3003 , CSC3501 , CSC3503, CSC3504
B6	The introduction, customization and management of IT systems	CSC3501 , CSC3504
B7	Giving advice and support to users in the operation of their IT systems	CSC3003 , CSC3501 , CSC3504
B8	Project management skills, including estimation and planning	CSC3303
B9	The application of IT systems to	

	other subject areas depending on specialism	CSC3003, CSC3501, CSC3504
B10	Designing and building realistic distributed systems and Internet applications	CSC3504
B11	Integration of a wide variety of protocols and platforms	CSC3504
C1	The ability to conduct investigations using the technical and professional literature	CSC3002, CSC3003, CSC3501, CSC3503, CSC3504
C2	The ability to use and evaluate appropriate tools and techniques	CSC3003, CSC3501, CSC3503, CSC3504
C3	The ability to undertake empirical evaluation of alternative solutions	CSC3003, CSC3006, CSC3503
C4	The ability to solve problems by identifying suitable approaches to using computer-based systems.	CSC3002, CSC3003, CSC3501, CSC3503, CSC3504,
D1	Written communication	CSC3002, CSC3003, CSC3501, CSC3303,
D2	Problem solving	CSC3002, CSC3501, CSC3503, CSC3504
D3	Interpersonal communication	CSC3501, CSC3303
D4	Initiative	CSC3002, CSC3003, CSC3501, CSC3504
D5	Adaptability	CSC3501, CSC3504
D6	Team work	CSC3303, CSC3501
D7	Numeracy	CSC3501, CSC3504
D8	Planning and organisation	CSC3003, CSC3303, CSC3501, CSC3504
D9	Computer literacy	CSC3002, CSC3003, CSC3501, CSC3504,

Mapping of Intended Learning Outcomes onto Curriculum/Modules

Intended Learning Outcome	Module codes (Compulsory in Bold)
A1	CSC1011, CSC1014, CSC1016, CSC2513, CSC2015, CSC2511, CSC3501, CSC3504, CSC3595
A2	CSC1011, CSC1014, CSC2513, CSC2015, CSC2511, CSC3003, CSC3002, CSC3303, CSC3595
A3	CSC1014, CSC1015, CSC2015, CSC2511, CSC2512, CSC3003, CSC3006, CSC3303, CSC3501, CSC3504
A4	CSC1014, CSC1016, CSC2513, CSC2015, CSC2512, CSC3003, CSC3006, CSC3501, CSC3504, CSC3595
A5	CSC3595
A6	CSC1014, CSC3504
A7	CSC3303
A8	CSC3303
A9	CSC3303
A10	CSC3303,
A11	CSC3006, non-CSCXXX modules.
B1	CSC1011, CSC1014, CSC1016, CSC2513, CSC2015, CSC2511, CSC3002, CSC3303, CSC3504, CSC3595
B2	CSC1011, CSC1014, CSC1016, CSC2015, CSC2511, CSC3595
B3	CSC1011, CSC1014, CSC1016, CSC2513, CSC2015, CSC2511, CSC3002, CSC3501, CSC3503, CSC3504, CSC3595
B4	CSC1014, CSC1015, CSC1016, CSC2513, CSC2015, CSC2511, CSC3003, CSC3501, CSC3504,
B5	CSC1011, CSC1014, CSC1016, CSC2015, CSC2511, CSC3501, CSC3504, CSC3595
B6	CSC1014, CSC1016, CSC2015, CSC2511, CSC2512, CSC3003, CSC3501, CSC3503, CSC3504, CSC3595
B7	CSC1014, CSC1015, CSC1016, CSC2513, CSC3003, CSC3501, CSC3504
B8	CSC1014, CSC1015, CSC3003, CSC3501, CSC3504
B9	CSC1011, CSC1014
B10	CSC2015, CSC3303, CSC3595
B11	CSC1014, CSC3003, CSC3501, CSC3504
B12	CSC1014, CSC3504
B13	CSC1014, CSC1016, CSC3504
B14	non-CSCXXX modules
C1	CSC1014, CSC1015, CSC1016, CSC2513, CSC2015, CSC2511, CSC2512, CSC3002, CSC3003, CSC3006, CSC3501, CSC3503, CSC3504, CSC3595
C2	CSC1011, CSC1014, CSC1015, CSC1016, CSC2513, CSC2015, CSC2511, CSC2512, CSC3003, CSC3006, CSC3501, CSC3503, CSC3504, CSC3595
C3	CSC1011, CSC1014, CSC1015, CSC1016, CSC2513, CSC2015, CSC2511, CSC3003, CSC3006, CSC3503, CSC3595
C4	CSC1011, CSC1014, CSC1016, CSC2513, CSC2015, CSC2511, CSC3002, CSC3003, CSC3006, CSC3501, CSC3503, CSC3504, CSC3595
D1	CSC1014, CSC1015, CSC1016, CSC2513, CSC2015, CSC2511, CSC2512, CSC3003, CSC3002, CSC3006, CSC3303, CSC3501, CSC3595
D2	CSC1011, CSC1014, CSC1015, CSC1016, CSC2513, CSC2015, CSC2511, CSC2512, CSC3002, CSC3006, CSC3501, CSC3503, CSC3504, CSC3595
D3	CSC1015, CSC2015, CSC2511, CSC2512, CSC3006,

	CSC3303, CSC3501, CSC3595
D4	CSC1011, CSC1014, CSC1015, CSC1016, CSC2513, CSC2015, CSC2511, CSC2512, CSC3002, CSC3003, CSC3006, CSC3501, CSC3504, CSC3595,
D5	CSC1015, CSC2015, CSC2512, CSC3006, CSC3595
D6	CSC1011, CSC1014, CSC1015, CSC1016, CSC2015, CSC2511, CSC2512, CSC3006, CSC3501, CSC3504, CSC3595
D7	CSC1015, CSC2015, CSC3006, CSC3303, CSC3501
D8	CSC2015, CSC2512, CSC3501, CSC3504
D9	CSC1011, CSC1014, CSC1015, CSC1016, CSC2513, CSC2015, CSC2512, CSC3003, CSC3006, CSC3303, CSC3501, CSC3504, CSC3595
D10	CSC1011, CSC1014, CSC1015, CSC1016, CSC2513, CSC2015, CSC2511, CSC2512, CSC3002, CSC3003, CSC3501, CSC3504, CSC3595