PROGRAMME SPECIFICATION

1 Awarding Institution  
Newcastle University  

2 Teaching Institution  
Newcastle University  

3 Final Award  
Master of Science (MSc)  

4 Programme Title  
Advanced Computer Science  

5 Programme Code  
5178F / 5178P  

6 Programme Accreditation  
The British Computer Society  

7 QAA Subject Benchmark(s)  
Computing  

8 FHEQ Level  
7  

9 Last updated  
May 2016  

10 Programme Aims  
1. To provide a qualification enhancing employment prospects in the wide range of IT based careers.  
2. To provide a foundation for students wishing to embark on a research career in academia or industry.  
3. To provide opportunities for students with a background in computer science to acquire further knowledge, both in breadth and depth, in a range of relevant advanced computer science topics.  
4. To equip students with a range of advanced practical computing skills.  
5. To equip students with professional skills in project management and team work.  
6. To develop and improve skills in written and oral communication.  
7. To provide students with the opportunities to acquire research skills.  
8. To provide an environment within the University such that students enjoy the University learning experience sufficiently to want to maintain contact in its future recruitment, teaching, research and social activities.  
9. To provide a programme which meets the accreditation requirements of the appropriate professional bodies, thus providing a basis for further professional development and lifelong learning.  
10. To provide a programme of study which meets FHEQ at Masters level and which takes appropriate account of subject benchmarks in QAA Computer Science at the Masters level and UK professional standards.  

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 have:  
A1 Background knowledge in advanced computer science concepts.  
A2 An advanced understanding of the fundamental principles and theories of computer science.  
A3 Advanced knowledge and understanding in the specific areas of computer science chosen as part of their study.  
A4 Knowledge and understanding of software development techniques.  
A5 Knowledge and understanding of the role of computing and computer science in society.
### Teaching and Learning Methods

The primary method of imparting knowledge and understanding (A1-A5) is lectures supported by practical work in tutorial classes and laboratories. Students will be encouraged to deepen understanding by independent reading in the relevant technical and scientific literature. This is supported by guidance in information literacy skills, given during induction and prior to the group and individual projects, and subject-specific guidance given in lectures. The group and individual projects also provide an important role, allowing students to strengthen and apply the knowledge they have gained and thus deepen their understanding.

### Assessment Strategy

Assessment of the technical knowledge and understanding (A1-5) is through a combination of unseen written examinations and assessed coursework in the form of coursework reports, project reports and presentations.

### Intellectual Skills

On completing the programme students should be able to:

- **B1** Critically evaluate research and literature relating to a wide range of computer science topics.
- **B2** Be creative and innovative in the solution of computer based problems.
- **B3** Critically evaluate, both theoretically and empirically, alternative solutions.
- **B4** Develop computing systems by applying professional judgements to balance risks, costs, benefits, safety, reliability, aesthetics and environmental impact.
- **B5** Evaluate and use appropriate computer based support tools and techniques.
- **B6** Plan, conduct and report a programme of novel investigative work.

### Teaching and Learning Methods

Intellectual skills (B1-6) are introduced and practised throughout the taught modules taken by the students. In particular, the taught modules make use of appropriate case studies in practical and tutorial classes to address these skills. Specific research skills are introduced through lectures on research methods (B1,B3,B5,B6). Both the team and individual student projects provide an important opportunity for students to apply and develop all these skills (B1-B6). Small group and one-to-one project supervision is employed in the team and individual projects to ensure students receive the support needed.

### Assessment Strategy

Research and design skills (B1-6) are assessed by the practical coursework assessments and by the reports and presentations associated with the team and individual projects. Analysis and problem solving skills (B2-5) are further assessed through unseen written examinations. Note that the reports, presentations and final dissertation associated with the individual research project are seen as key assessments for these intellectual skills.

### Practical Skills

On completing the programme students should be able to:

- **C1** Apply advanced practical skills in the specific areas of computer science chosen as part of their study.
- **C2** Design, model and implement computer based systems.
- **C3** Apply appropriate engineering techniques to a range of computer based problem areas.
- **C4** Use the scientific literature effectively to search for information to address research problems.
- **C5** Prepare technical reports and give technical presentations.
- **C6** Manage a research project.
### Teaching and Learning Methods

Practical skills (C1-6) are developed through hands-on practical exercises, coursework assignments and project work. Support for this is provided by lectures, tutorials, and practical classes. Both the team project and individual research project provide an important opportunity for students to develop these skills (C1-6) supported by appropriate feedback from team monitors and project supervisors.

### Assessment Strategy

Practical skills (C1-6) are assessed through various coursework assignments associated with taught modules and through the range of project deliverables (e.g., progress reports, presentations, demonstrations and dissertation) associated with the team and individual projects.

### Transferable/Key Skills

On completing the programme students should be able to:

- **D1** Communicate effectively (verbally and in writing).
- **D2** Have an ability to work effectively as part of a team.
- **D3** Develop novel ideas and solutions to engineering and scientific problems.
- **D4** Manage resources and time, plan, organise and prioritise work effectively to meet deadlines.
- **D5** Use information and communications technology.
- **D6** Learn independently in familiar and unfamiliar situations with open-mindedness and in the spirit of critical enquiry.
- **D7** Learn effectively for the purpose of continuing professional development and in a wider context throughout their career.

### Teaching and Learning Methods

Transferable skills (D1-7) are developed through coursework exercises in the taught modules and project work. Basic communication skills (D1) will be acquired through the team and individual projects. These are then developed and enhanced through feedback on written reports and presentations. Support for this is provided by supervisory meetings and the research methods module. The team working skills (D2) are directly developed during the team project. Deadlines for submission of coursework and reports are enforced, encouraging students to develop time and resource management skills (D4). Note that the individual research project provides an important role in developing these key skills (D1,D3-7).

### Assessment Strategy

Transferable and communication skills (D1,D3-D7) are assessed throughout the taught modules via coursework exercises (including reports and presentations) and by progression monitoring activities. The team project directly assesses students’ ability to work as part of a team (D2). The individual research project includes reports, presentations and a final dissertation which are important elements in assessing these skills (D1,D3-7).

### Programme Curriculum, Structure and Features

**Basic structure of the programme**

The programme is studied over one year full-time, or two years part-time. There is a single stage to the programme, requiring the study of 180 credits. A 10 credit module consists of 100 hours of student effort, covering lectures, practical classes, small group teaching and
private study, completion of coursework and revision. The typical modules vary in size from 5 credits to 15 credits. There is one 90-credit module containing the individual project.

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

The MSc in Advanced Computer Science will deliver trained postgraduate students who have advanced knowledge, understanding and skills that will equip them for a career in Academia or IT Industry. Particular features of the programme are:

- Flexible programme of study that students can tailor to their individual interests and needs.
- Provides students with a well-rounded computer science research training to promote development of skills in computer and information systems.
- Enhances employment possibilities in the IT industry.
- Provides students with a foundation to begin a career in an industrial or academic research environment.
- Provides training to students to develop both technical and professional skills to underpin personal development and future career success.

Programme regulations (link to on-line version)


Support for Student Learning

The Student Services portal provides links to key services and other information and is available at: https://my.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 principal 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 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 the University’s IT Service (NUIT), which supports campus-wide computing facilities.

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.

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 Board of Studies Student opinion is sought at the Student-Staff Committee and/or the Board of Studies. The introduction of new modules and major changes to existing modules are subject to approval by the Faculty Learning Teaching and Student Experience Committee (FLTSEC).

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to FLTSEC. The FLTSEC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the Taught Programmes Sub Committee.

External Examiner reports
External Examiner reports are considered by the Board of Studies. External Examiner reports and the response to the External Examiner from the Board of Studies are shared with institutional student representatives, through the Student-Staff Committee.

Student evaluations
All modules and the degree programme, are subject to review through online 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, the Board of Studies.

Faculty and University Review Mechanisms
Every six years degree programmes in each subject area undergo Learning and Teaching 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
The BCS have approved this programme for accreditation for CITP Further Learning Element, CEng/CSci (Partial Fulfilment).

15 Regulation of assessment

Pass mark
The pass mark is 50

Course requirements
Progression is subject to the University’s Postgraduate Taught Progress Regulations and Examination Conventions. There are reassessment opportunities, with certain restrictions. Additional programme-specific requirements can be found in the Programme Regulations.

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

<table>
<thead>
<tr>
<th>Summary description applicable to postgraduate Masters programmes</th>
<th>Summary description applicable to postgraduate Certificate and Diploma programmes</th>
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<tbody>
<tr>
<td>&lt;50</td>
<td>Fail</td>
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<tr>
<td>50-59</td>
<td>Pass</td>
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<tr>
<td>60-69</td>
<td>Pass with Merit</td>
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<tr>
<td>70 or above</td>
<td>Pass with Distinction</td>
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<tr>
<td>&lt;50</td>
<td>Fail</td>
</tr>
<tr>
<td>50 or above</td>
<td>Pass</td>
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Role of the External Examiner
An External Examiner, a distinguished member of the subject community, is appointed by University, following recommendation from the Board of Studies. The External Examiner is required to:

i. confirm whether the standards of the University’s awards meet or exceed the academic standards specified in external reference points such as the Framework for Higher Education Qualifications, the UK Quality Code, subject benchmark statements, and, where appropriate, the requirements of professional, statutory and regulatory bodies;

ii. confirm whether the academic standards of the University’s awards are consistent with those of similar programmes in other UK higher education institutions;

iii. report on whether the University’s processes for assessment measure student achievement rigorously and fairly and are conducted in line with University policies and regulations;

iv. identify, where appropriate, examples of exemplary practice and innovation in learning, teaching and assessment;

v. comment on opportunities to enhance the quality of the learning experience provided to students.
In addition, information relating to the programme is provided in:

<table>
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<tr>
<th>The University Prospectus:</th>
<th><a href="http://www.ncl.ac.uk/postgraduate/">http://www.ncl.ac.uk/postgraduate/</a></th>
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<tbody>
<tr>
<td>Degree Programme and University Regulations:</td>
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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.
### Annex

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

<table>
<thead>
<tr>
<th>Intended Learning Outcome</th>
<th>Module codes (Compulsory in Bold)</th>
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<tbody>
<tr>
<td>A1</td>
<td>CSC8404, CSC8406, CSC8103, CSC8201, CSC8104, CSC8105, CSC8202, CSC8110, CSC8111, CSC8102, CSC8106, CSC8204, CSC8108, CSC8203, CSC8499</td>
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<td>A5</td>
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