PROGRAMME SPECIFICATION 2025-26

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**	BSC, The Chartered Institute for IT
7	**QAA Subject Benchmark(s)**	Computing
8	**FHEQ Level**	7
9	**Last updated**	September 2024

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 teamwork.
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 techniques for developing computer-based solutions and applications.

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 team 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).

12 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 lecture, practical classes, small group teaching and private study, completion of coursework and revision. The typical modules size is 10 credits but there is one 20 credit module. 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.
- Allows students to gain an understanding and practical skills in a range of advanced computing areas.
- 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)

5178F/P

13 Support for Student Learning

Generic information regarding university provision is available at the following link.

Generic Information

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

Generic information regarding university provision is available at the following link.

Generic Information

Accreditation reports

The BCS have approved this programme for accreditation for CITP Further Learning Element, CEng/CSci (Partial Fulfilment).
The Chartered Institute for IT

Additional Mechanisms

15 Regulation of assessment

Generic information regarding university provision is available at the following link.

Generic Information

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

The University Prospectus: http://www.ncl.ac.uk/undergraduate/degrees/#subject

Degree Programme and University Regulations: University Regulations | University Regulations | Newcastle University

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.