

Nottingham Trent University Course Specification

Basic Course Information

1.	Awarding Institution:	Nottingham Trent University
2.	School/Campus:	Science & Technology/Clifton Campus
3.	Final Award, Course Title and Modes of Study:	MComp (Hons) Computer Science FT MComp (Hons) Computer Science SW
4.	Normal Duration:	Full Time 4 years, Sandwich 5 years
5.	UCAS Code:	G410 (FT) or G411 (Sandwich)

6. Overview and general educational aims of the course

The MComp (Hons) Computer Science degree has been designed for exceptional undergraduate students who wish to further their education to a higher level. You will study for a further year beyond the undergraduate degree, at the higher level of MSc level (level 7). This year will include a number of challenging modules that will stretch you further and introduce you to more advanced topics at the cutting-edge of computer science. The course will enable you to develop the knowledge and skills necessary for a broad range of careers in industrial, commercial and scientific computing. It meets the accreditation requirements of BCS – The Chartered Institute for IT, for CITP registration.

Accreditation of courses by the BCS provides independent recognition that the course content is relevant to the IT profession. It ensures a level of standardisation across Higher Education institutions so that the courses meet the needs of employers. A key part of the accreditation is the incorporation of professional, ethical, social and legal issues relating to computing. Graduating from a BCS accredited degree allows students to apply for professional membership of the BCS, giving an accelerated route to Chartered status. Employers often look for accredited degrees, and accredited degrees are recognised internationally.

The course puts theory into practice through skills development relevant to the modern world. It offers skills development as an integral part of the curriculum and as preparation for the world of work. As well as practical skills necessary for the Computing professional, you will develop transferable skills which will make you suitable for general graduate employment in an ever-changing job market. The additional MComp year will extend your skills profile to include embedded systems and security, and choices of management, robotics and information security.

As well as giving you a robust general education in Computing, the Computer Science degree will provide the knowledge and skills necessary for research and development in technically advanced fields of computing.

There are many opportunities throughout the course that include international learning. In particular, students conducting projects at level 6 are expected to interpret their results within a wider, international context.

The salaried placement year is an important feature of the course. It is optional and requires an application process through a company, but if chosen it will give you a distinct advantage on graduating, and we have an excellent placements office to provide support in finding a placement that is right for you.

In brief, the course aims to:

- Equip you with the knowledge and skills necessary for a broad range of professional careers in industrial, commercial and scientific computing
- Enable you to develop a range of transferable skills in preparation for general graduate employment and an ever-changing job market
- Provide you with the foundation for postgraduate study at PhD level
- Develop the combination of skills and knowledge required to undertake research and development work involving technically advanced computer applications
- Equip you with the theory and project management skills to become a manager of a Computer development team.
- Enable you to develop appropriate solutions to computer science problems, using new or existing technologies, through innovation, creativity and change.

Flexibility is built into the course design with options for one-sixth of study (20 credit points from 120 credit points) at level 5 and level 7. Options include management, cybernetics, information security, games algorithms (at level 7); and programming modules (at level 5). Also, the common first year (level 4) with BSc (Hons) Computer Science, BSc (Hons) Computer Science (Games Technology), and BSc (Hons) Software Engineering allows for transfer between any of these courses at the end of the first year. In addition to this, students who have achieved an average of 60% or above at level 5, with passes (including compensated passes) at the first attempt, may transfer from BSc (Hons) Computer Science on to the MComp (Hons) Computer Science degree at the end of year 2 (level 5).

7. **Course outcomes**

Course outcomes describe what you should know and be able to do by the end of your course if you take advantage of the opportunities for learning that we provide.

Knowledge and understanding

By the end of the course you should be able to:

1. Demonstrate an advanced knowledge of the fundamental characteristics and constituents of computer systems i.e. computer architecture and the way information is processed, stored and communicated (B)
2. Contribute to the analysis and solution of research and development problems in technically advanced computer applications and be able to discuss some current research issues (B)
3. Describe the role of the computing professional and discuss the social and legal aspects of information systems (B)
4. Apply appropriate techniques for quality assurance to ensure fitness for purpose, reliability, timeliness and maintainability of computer systems (B)
5. Demonstrate understanding of advanced engineering principles and techniques and their applications to a wide range of problems in computer systems (B)
6. Describe the principles of and apply a range of techniques involved in at least two specialist areas of computer science (e.g. Artificial Intelligence and Embedded Systems) using appropriate tools (B)

Skills, qualities and attributes

By the end of the course you should be able to:

7. Show analytical judgement in the selection and use of appropriate analysis and design techniques for advanced computing problems (B)
8. Exercise critical judgement about the use of novel platforms, languages and environments and the techniques employed in managing computing projects. (B)
9. Show innovative problem solving and critical evaluation skills and the ability to apply appropriate testing and quality control measures to a range of computing applications. (B)
10. Work effectively as part of a team and as an independent learner (B)
11. Program and implement advanced computer systems using the tools of the computing professional e.g. compilers, databases, operating systems (B)
12. Effectively communicate concepts, plans and designs, using a variety of approaches, including written, oral and computer based presentations. (B)
13. Gather, organise and interpret technical information demonstrating a high level of IT competency and numeracy (B)

(B) indicates that the outcome has been mapped to the Computing benchmark standards(B) indicates that the outcome has been mapped to the Computing benchmark standards, which can be found at
<http://www.qaa.ac.uk/en/Publications/Documents/SBS-Computing-16.pdf>

The Computing benchmark standards provide a national framework for describing the content and standards of undergraduate and postgraduate degrees in Computing disciplines.

8. Learning and teaching methods

The teaching methods used on this course have evolved over a number of years based on feedback, review and reflection. Our approach is to use practical illustration and first-hand experience to enhance learning wherever possible.

Learning is facilitated in a range of different ways. Most modules involve a series of lectures to explain and develop the subject concepts to you. These are accompanied by either seminars or laboratory sessions or sometimes a combination of both. In these you apply the theory from the lectures. This leads to a more thorough understanding of the subject and the development of any practical skills associated with it. The seminars and laboratories are also often used to help you in coursework assignments, which in themselves help to embed knowledge and develop skills. In the laboratory sessions, staff will help you to explore and use the technology, and give you feedback on your practical work. They will discuss links between theory and practice in these sessions. Some modules have optional surgery sessions to support learners. These are student-driven in that students bring to the sessions questions on any aspects of the module that they are finding difficult.

The university runs an online Virtual Learning Environment (NOW) to support teaching and learning. All modules are represented on the NOW and most use it to provide you with the material associated with the module. Our aim is to support your development into an autonomous independent learner.

The nature of the subject means that much of your learning will be computer-aided. As well as using development environments and packages for coursework implementation tasks, you will also use some computer-aided learning packages and techniques such as online discussion groups. Again, we aim for you to become an engaged learner who takes responsibility for your learning.

The development of your independent learning skills will include the undertaking of a substantive project. This involves you working on a topic aligned to your degree, which you choose in consultation with your project supervisor. You will see your supervisor throughout the third taught year (level 6) and they will guide you in your work. Your project will bring together the knowledge and skills that you have gained at levels 4 and 5 – analysis and design techniques, software or hardware implementation, testing procedures etc. And so, as part of this project, you will be

well placed to reflect on the skills and experiences achieved so far throughout your degree in relation to employment aspirations and, in particular, through engagement with the project.

In the final year (level 7), you will be experience the challenges of a multi-disciplinary project. Again, you will be supported throughout.

9. Assessment methods

Modules are either assessed via coursework, exam or a combination of both. Coursework makes up over half of the total assessment for the programme.

Coursework assessments can take many forms. You will often be given a practical task to do for the assignment which you then write up in a report. You may also have to demonstrate what you have done or give a presentation on it. Some modules involve an element of seminar contribution in the assessment and some others use computer-based assessment. Your individual MComp project will give you an opportunity to specialise in an area of Information Technology that interests you. You will undertake practical work which you will demonstrate and report on in a dissertation.

The range of assessment methods aims to give students a variety of ways in which to demonstrate achievement as well as encouraging the development of the communication skills valued by employers.

10. Course structure and curriculum

The course is studied over 5 years for the sandwich mode or 4 years, full time. On the sandwich route you apply to obtain a paid placement with a company working for 9 months or more between your second year (level 5) and your third taught year (level 6). The placement will be in the IT industry. In full time mode, you will go direct to the third taught year (level 6) after the second year (level 5).

You will study a course of modules as indicated below. These develop your knowledge and skills along themes of: professional skills and business knowledge; software engineering; information systems; computing infrastructure; and specialist applications. Between them they develop the learning outcomes of the course. The mapping between the modules and the course outcomes is known as a curriculum map and is available should you be interested to see this.

Development of employability is a key strength of the course. This is achieved through the technical and personal skills you develop which are sought after by employers. Preparation for work is covered in the professional development theme where you learn about CV writing and career planning.

You need to obtain 480 cp (credit points), 120cp per year, to gain the MComp (Hons) qualification. Students are also required to achieve an average of 60% each year of the MComp (Hons) degree. Those not achieving this level will be transferred to the equivalent BSc (Hons) degree. Your final degree classification will be based on your third taught year (level 6) mark (50%) and your final year (level 7) mark (50%). Students who do not obtain enough credit points may be eligible for one of the following awards: Certificate of Higher Education (120 cp), Diploma of Higher Education (240 cp), Ordinary degree (300 cp), or BSc (Hons) degree (360 cp).

Successful completion of the year of industrial experience is necessary for you to gain the sandwich award. You will write a report detailing the work undertaken by you and evaluating your part in the overall company context. You will also receive a Placement Diploma in Professional Practice.

Year 1 (level 4)

Foundations of Computing Technology and Programming	20cps
Essential Skills	20cps
Computer Science Programming	20cps
Computer Technology and Mathematics	20cps
Systems Analysis and Design	20cps
Professional Development for Industry	20cps

Year 2 (level 5)

Information and Database Engineering	20cps
Practical Project Management and Professional Development	20cps
Software Design and Implementation	20cps
Systems Software	20cps

And choose from:

Internet Applications Programming	20cps
or Software Engineering	20cps
and Applied Mathematics and Graphics	20cps
or Machine Learning for Data Analytics	20cps

Year 3 - Industrial Placement year for Sandwich students

Year 3 (FT) or Year 4 (SW) (level 6)

Project for MComp	40cps
Advanced Analysis and Design	20cps
Artificial Intelligence	20cps
Advanced Software Engineering	20cps
Service-Centric and Cloud Computing	20cps

Year 4 (FT) or Year 5 (SW) (level 7)

Group Design Project	20cps
Embedded Systems	20cps
Applied Artificial Intelligence	20cps
Cyber Security	20cps

And choose two 20cp modules from:

Entrepreneurial Leadership and Project Management	20cps
Global Business Management	20cps
Robotics and Cybernetics	20cps
Information Security Management	20cps

11. Admission to the course

For current information regarding all entry requirements for this course, please see the 'Applying' tab on the NTU course information web page. The full UCAS entry profile for this course can be found at: <http://www.ucas.com/>

12. Support for learning

We will work with you to ensure that you settle into your new academic environment and that your studies go well, and you will find that there are lots of people to support you at Nottingham Trent University.

All students at Nottingham Trent University have full access to Student Support Services. In addition, School based support networks are in place to offer you support, guidance and advice on academic and personal issues. Within the course, students experience the full support of the Computing and Technology Academic Team. The Head of Department, with support from the Course Manager, Course Leader(s), Module Leader(s), and Personal Tutor, takes responsibility for student support and guidance. The Module Leader will offer guidance and support to students taking each specific module

As a new student, you will experience a minimum of a 3 day induction period at the commencement of your first academic year. Induction will inform you about:

- Student Support Services at University, School and Course level;
- University policies and procedures on academic systems;
- Personal development planning;
- Timetable issues, room allocations and location;
- University, School and Course Handbooks;
- Enrolment procedures;
- Computing, IT and Library services;
- Health and Safety procedures.

You receive a course handbook that contains the essential information about the course and the support we provide for your learning. You also meet your personal tutors and year tutors. There is also a special induction programme for direct entrants to level 5 / level 6.

You are assigned a personal tutor at the start of the course. They meet with you in a small group during the first year and provide you with any advice and support that you may need. Year tutors and a course leader oversee the smooth running of the course and they also serve as an additional source of support and advice for you. Every year, you will have regular time-tabled sessions with your Personal Tutor, in small groups. Your group tutorials will help you to reflect on your approaches to study and make connections between modules, integrating material from across the curriculum and encouraging you to achieve your maximum potential. You will also have an opportunity to discuss and deal with any personal or course-related issues which may be affecting your studies and get advice on what support the university can offer. Personal tutorials can also be used for personal development planning and skills development.

In particular, at level 4, you will meet your personal tutor during welcome week at a designated "Meet your personal tutor" session. This session includes familiarisation with NTU resources – email accounts, student timetables, NOW resources etc.. Each personal tutor group consists of approximately 12 students. As part of this personal tutor group, you will meet your personal tutor for one hour, weekly, throughout the whole of level 4. Your group of students will be paired with another personal tutor group to make up a seminar/lab group. This seminar/lab group (of approximately 24 students) will

be timetabled in the same lectures, seminars and labs throughout the year (subject to a course transfer). Throughout term 1 of level 4, your term 1 tutorials will include content such as time management, mental health/resilience, NTU procedures etc. Throughout terms 2 and 3 of level 4, your tutorials will continue with a greater emphasis on professional development, including content such as working in a team, presentation skills, CV development etc. You will also meet individually with your personal tutor at two points during terms 1 and 2. These individual consultations will include reflection on your progress made, consideration of any barriers to learning and target setting.

In particular, at level 5, you will have personal tutorials scheduled at intervals during the year. You will also have further scheduled contact with your personal tutor throughout terms 1 and 2, as part of the Practical Project Management and Professional Development module (where the personal tutor acts as the project supervisor). The personal tutor group consists of approximately 12 students. Your personal tutor group will meet your personal tutor for one hour at five timetabled sessions during level 5. These tutorials will include content such as CV development, time management skills, goal setting.

In particular, at level 6, you will have personal tutorials scheduled at intervals during the year. You will also have further regular contact with your personal tutor throughout the year, as your project supervisor for the Project for MComp module. The first tutorial is a group tutorial (normally between 3 and 6 students from a range of C&T UG courses) that will cover target setting and reflection on study skills for the year. The remaining four tutorials will be 1-to-1 discussions including content such as career planning, reflection on feedback, preparation for the C&T Degree Show.

In particular, at level 7, you will have personal tutorials scheduled with your courses manager at intervals during the year. These personal tutorials will be group tutorials consisting of all students at level 7 on the MComp Computer Science course, in order to aid the course community. The tutorials will include content such as career planning in the area of management and postgraduate research.

Extensive online module information including learning materials is provided on the university virtual learning environment (NOW). This also includes course information such as the course handbook and assessment deadlines. We have excellent laboratory facilities with some 24 hour availability for IT labs. The school has a Student Information Desk for assessment handin, handback, queries about fees and other general queries.

If you decide to opt for the sandwich award, our placements tutor will work with you to develop your CV and will help you to target your applications so

that you get a placement that is right for you. You will be assigned a visiting tutor who will visit you at the company. Successful completion of your placement, including a written report, will enable you to receive a Diploma in Professional Practice.

We also provide you the opportunity of gaining experience in mentoring and leadership skills by applying to the CERT mentor scheme. Selected levels 5 and 6 students can develop these skills by running support sessions for students from lower levels as well as assisting at Open Events. Successful completion of a related assessment will enable you to be awarded the Certificate in Mentoring and Leadership Development after two years.

The university provide Student Support Services, who offer extensive support and advice on a range of issues, e.g. financial problems, dyslexia and disability and personal problems.

http://www.ntu.ac.uk/current_students/resources/sources_support/index.html

The School has a dedicated Student Support Advisor, who is on hand to advise you in the first instance.

For accommodation matters, University Accommodation Officers will provide you with information, guidance and continuing support, for example hall of residence, private rented accommodation, and the Landlord Approval Scheme. The Accommodation Services can be accessed through www.ntu.ac.uk

13. **Graduate destinations/employability**

Graduate employability is fundamental to the strategic aims of Nottingham Trent University, as reflected by the fact that NTU is consistently placed close to the top of the league table of all UK Universities for graduate employment.

The generic attributes acquired through the Computer Science course will equip you with the knowledge and skills necessary for employment in almost all computing related fields and in specialist areas such as AI and embedded systems. In particular, the course will prepare you with the key skills and knowledge essential to undertake computer systems development based on advanced technology as well as the transferable skills to enable you to be a project manager. The technical nature of the course provides the necessary underpinning to enable you to engage in scientific and technological research.

The BCS accreditation paves the way to a structured framework for career development. Whilst still being required to meet relevant professional experience requirements, graduates from accredited programmes will benefit from an accelerated route to CITP status. Individuals with a fully accredited degree are also eligible for professional membership of BCS (MBCS) at the point they graduate. The course provides a progression pathway to professional registration by fulfilling the academic requirements for CITP and a potential advantage when looking for a job as some employers may look for graduates with accredited degrees.

Some graduates will choose to venture into other sectors and will be equally successful in gaining employment because of the transferable skills developed on the programmes. Other graduates from the School go on to further study, or research. In addition to the expertise available within the School, the University has a comprehensive careers service open to all students to assist in securing employment:

<https://www4.ntu.ac.uk/employability/>

14. Course standards and quality

All aspects of quality management within the School are in accordance with the University's Quality Handbook. The Course Management Team, which includes the Course Manager and Module Leaders, oversees the operational arrangements for the Course. In addition, the Course Committee, central to which are the student representatives, meets regularly throughout the year to review, evaluate and develop the Course. Formal course monitoring takes place at the end of each module through the administration of questionnaires offering closed and open ended questions, which is in addition to informal feedback received from students throughout the year.

Overarching responsibility for quality control lies with the School Academic Standards and Quality Committee whose remit is to provide guidance and support to academic Courses. External Examiners offer further quality control through monitoring academic standards, moderation of assessment tasks and processes. Feedback from the Course Committee and student evaluation at module and course level inform the Interim Course Report (ICR), which reviews and evaluates the student experience at course level. In turn the ICR informs the School Quality and Enhancement Plan (SQEP), which is presented to the University as part of the institutions quality assurance and enhancement cycle. The ICR also informs a Periodic Course Review every three years to ensure that the course remains current and that standards have been maintained.

The subject benchmarks of the Quality Assurance Agency have been incorporated into the course's learning outcomes.

15. Assessment regulations

<p>This course is subject to the University's Common Assessment Regulations (located in Section 16 of the Quality Handbook). Any course specific assessment features are described below:</p>	
<p>The MComp (Hons) Computer Science course has been designed to meet the accreditation requirements of BCS – The Chartered Institute for IT, for both CITP Further Learning and Full CEng registration. The BCS requires a team-based, major project at level 6 or above to be passed without compensation. This criterion will be met by the individual project (Project for MComp) at level 6 and the Group Design Project at level 7.</p> <p>In summary, the Group Design Project at level 7 (as well as the Project for MComp at level 6) must be passed without compensation.</p>	
<p>16. Additional information</p>	<p>Collaborative partner(s): N/A</p> <p>Course referenced to national (QAA) Benchmark Statements: Computing</p> <p>Course recognised by: BCS – The Chartered Institute for IT</p> <p>Date this course specification approved:</p>
<p>Any additional information:</p> <p>The Computing benchmark can be found at: http://www.qaa.ac.uk/en/Publications/Documents/SBS-Computing-16.pdf</p> <p>The BCS website is at: http://www.bcs.org/</p> <p>Additional information - The common first year with BSc (Hons) Computer Science, BSc(Hons) Computer Science (Games Technology) and BSc(Hons) Software Engineering allows for transfer between these courses at the end of the first year. In addition to this, students with sufficiently high grades may transfer on to the MComp (Hons) Computer Science degree at the end of year 2 (level 5). Several modules are also shared with BSc (Hons) Computer Systems (Networks), BSc (Hons) Computer Systems (Forensics and Security), BSc (Hons) Computer Systems Engineering, BSc (Hons) Information and Communications Technology, BSc (Hons) Digital Media Technology, BSc (Hons) Information Systems and BSc (Hons) Computing, and MComp (Hons) Computer Systems Engineering, as well as modules from the MSc suite of courses.</p>	