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 Systems Engineering FT MComp (Hons) Computer Systems Engineering SW
4.	Normal Duration:	Full Time 4 years, Sandwich 5 years
5.	UCAS Code:	G412 (FT) or G413 (Sandwich)

6. Overview and general educational aims of the course

The MComp (Hons) Computer Systems Engineering 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 systems. The MComp (Hons) course prepares you for a career as a Computer Systems Engineer in the Computing industry. You will understand how large systems consisting of a variety of components, be they computer or networking hardware or software, are built so that the components work together to create a solution for an industry. Your understanding will be developed through practical illustration and experience so that you will become able to engineer such solutions. As a graduate, you will be able to contribute as an IT professional to Computer Systems Engineering projects in a technical capacity with the potential to move into management or consultancy roles.

The course meets the accreditation requirements of BCS – The Chartered Institute for IT, for CITP registration. Accreditation of courses by the British Computer Society (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 is underpinned by introductions to computer and networking hardware, software development and information systems. You will then gain more specialist expertise in networking and software development. Alongside this, you will be developing the ability to analyse problems and design solutions to meet computer

system requirements. The course aims to enable you to integrate hardware components together, being able to write any software that may be required to facilitate the integration. The additional MComp year will extend your skills profile to include embedded systems and security and choices of management and robotics.

The curriculum provides skills development for your progression into the world of employment. Good communication and organisational skills are highly sought after by employers and these will also help you to take advantage of opportunities that arise in order to progress in your career.

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 skills and knowledge necessary to become a professional Computer Systems Engineer
- Equip you with the knowledge and skills for a range of careers in technology and computer-based industry.
- Enable you to develop a range of transferable skills in preparation for general graduate employment and an ever-changing job market.
- Equip you with the theory and technical skills to become a manager of a Computer Systems team.
- Enable you to develop appropriate solutions to computer systems problems, using new or existing technologies, through innovation, creativity and change.
- Provide you with the foundation for postgraduate study at PhD level.

Flexibility is built into the course design with options for one-sixth of study (20 credit point module) at level 6 and level 7. Options include programming modules and information systems management (at level 6); and cybernetics and management modules (at level 7). Also, this course is in a cluster with BSc (Hons) Computer Systems Engineering, BSc (Hons) Computer Systems (Networks) and BSc (Hons) Computer Systems (Forensic and Security). The commonality of modules studied enables the possible transfer between these courses after you have completed part of your Level 4 study. 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 the BSc (Hons) Computer Systems Engineering degree on

to the MComp (Hons) Computer Systems Engineering 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. Apply appropriate software and/or hardware tools to design, develop and critically evaluate innovative solutions to computing and Internet security problems. (B)
2. Demonstrate understanding of advanced engineering principles and techniques and their applications to a wide range of problems in computer systems. (B)
3. Conduct research in a range of advanced computing applications based upon the body of knowledge. (B)
4. Describe the role of the Computer Systems Engineer in the design and development of computer systems that are fit for purpose and timely. (B)
5. Demonstrate a comprehensive understanding of computer systems involving networks and communication in solving advanced problems. (B)

Skills, qualities and attributes

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

6. Analyse, design and develop robust software systems, with accompanying documentation. (B)
7. Exercise critical judgement about the use of novel platforms, languages and environments and the techniques employed in managing computing projects. (B)
8. Show innovative problem solving and critical evaluation skills and the ability to apply appropriate testing and security measures to a range of computing applications. (B)
9. Work effectively as part of a team and as an independent learner (B)
10. Effectively communicate concepts, plans and designs, using a variety of approaches, including written, oral and computer based presentations. (B)
11. Demonstrate expertise and be innovative in applying security principles in IT applications. (B)

(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 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; communications technology 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
Systems Technology	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
Network Design and Administration	20cps
Communications Technology	20cps
Distributed Network Architectures and Operating Systems	20cps

Year 3 (SW) - Industrial Placement year for Sandwich students

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

Project for MComp	40cps
Advanced Analysis and Design	20cps
Internet of Things	20cps
Service-Centric and Cloud Computing	20cps

And choose one 20cp module from:

Advanced Software Engineering	20cps
Information Systems Management	20cps
Mobile Platform Applications	20cps

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

Group Design Project	20cps
Embedded Systems	20cps
Network and Cloud Security	20cps
Cyber Security	20cps
Information Security Management	20cps

And choose one 20cp module from:

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

The facilities available on Clifton Campus provide you with a first-class teaching and learning environment. There are numerous PC-based teaching rooms that have been set-up with the appropriate software for you to complete your studies. Specific to your course, there are two specialist isolated network laboratories.

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 will receive a course handbook that contains the essential information about the course and the support we provide for your learning. You will 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 Systems Engineering 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.

As a graduate of the Computer Systems Engineering course you will have the knowledge and skills to become a professional Computer Systems Engineer specialising in for example telecommunications or automation. You will also be able to take up roles across a wide spectrum of jobs in the mainstream computing industry. These include system/software developer and support

roles and managerial (team leading or project management) and consultancy roles. 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**

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:

The MComp (Hons) Computer Systems Engineering 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.
In summary, the Group Design Project at level 7 (as well as the Project for MComp at level 6) must be passed without compensation.

16. **Additional information**

Collaborative partner(s):	**N/A**
Course referenced to national (QAA) Benchmark Statements:	**Computing**
Course recognised by:	**British Computer Society (BCS)**
Date this course specification approved:	

Any additional information:

The Computing benchmark can be found at:
http://www.qaa.ac.uk/en/Publications/Documents/SBS-Computing-16.pdf

The BCS website is at:
http://www.bcs.org/

Additional information -
The common first year with BSc (Hons) Computer Systems 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 Systems Engineering 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 Science, as well as modules from the MSc suite of courses.