

Title of Programme: BSc (Hons) Computer Science and Information Technology

Programme Code: CMCSIT

# Programme Specification

This programme specification is relevant to students entering:  
01 September 2023

Associate Dean of School (Academic Quality Assurance):  
Choose an item.



A programme specification is a collection of key information about a programme of study (or course). It identifies the aims and learning outcomes of the programme, lists the modules that make up each stage (or year) of the programme, and the teaching, learning and assessment methods used by teaching staff. It also describes the structure of the programme, its progression requirements and any programme-specific regulations. This information is therefore useful to potential students to help them choose the right programme of study, to current students on the programme, and to staff teaching and administering the programme.

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**Summary of amendments to the programme:**

Section	Amendment

If you have any queries regarding the changes please email [AQO@herts.ac.uk](mailto:AQO@herts.ac.uk)

# Programme Specification BSc (Hons) Computer Science and Information Technology

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This programme specification (PS) is designed for prospective students, enrolled students, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content for each module can be found in Definitive Module Documents (DMDs) and Module Guides.

## Section 1

<b>Awarding Institution/Body</b>	University of Hertfordshire
<b>Teaching Institution</b>	University of Hertfordshire
<b>University/partner campuses</b>	College Lane
<b>Programme accredited by</b>	BCS, The Chartered Institute for IT   BCS
<b>Final Qualification</b>	BSc Honours
<b>All Final Award titles</b>	Computer Science
<b>(Qualification and Subject)</b>	Computer Science (Artificial Intelligence) Computer Science (Cyber Security and Networks) Computer Science (Software Engineering) Information Technology
	Computer Science with Sandwich award Computer Science (Artificial Intelligence) with Sandwich award Computer Science (Cyber Security and Networks) with Sandwich award Computer Science (Software Engineering) with Sandwich award Information Technology with Sandwich award
	Computer Science with Year Abroad Computer Science (Artificial Intelligence) with Year Abroad Computer Science (Cyber Security and Networks) with Year Abroad Computer Science (Software Engineering) with Year Abroad Information Technology with Year Abroad
<b>FHEQ level of award</b>	6

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## A. Programme Rationale

The BSc Honours in Computer Science and Information Technology is a very well-established and highly popular degree programme, both for applicants to the programme, and for employers seeking to recruit graduates from the programme. The programme draws on the research strengths of the Department of Computer Science, in particular its internationally recognised research into artificial intelligence. The programme structure and its content have been developed with reference to the benchmark statements of the QAA and the British Computer Society (BCS), and to the curriculum guidelines published by the Association for Computing Machinery (ACM). In addition to academic development, the programme also recognises the importance of developing students' professional and civic character, as articulated through the University's Graduate Attributes.

The programme recognises a clear distinction between Computer Science (CS) and Information Technology (IT), and is structured so as to allow students to progress along two different routes. There is a common core of compulsory material to both themes in the first year of study to ensure that all students have the appropriate foundation for either route. For the computer science theme, the programme offers further specialisation at level 6 providing the opportunity for students to graduate with degree awards in four areas: computer science, software engineering, cyber security and networking, and artificial intelligence.

Both themes provide the opportunity for students to undertake a period of industrial placement, and so develop their understanding and skills within a professional environment. Alternatively, students may choose to undertake a period of study abroad, and so develop their understanding and skills within a different cultural environment.

The programme therefore equips graduates for a wide variety of careers in professional roles (not necessarily constrained to the Computing and IT sectors) that involve designing, developing, configuring, operating, maintaining or evaluating programmed systems, or wider socio-technical systems involving a programmed sub-system.

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## B. Educational Aims of the Programme

The programme has been devised in accordance with the University's graduate attributes of programmes of study as set out in [UPR TL03](#).

### **Additionally this programme aims to:**

Provide students with the opportunities to:

- develop a range of cognitive abilities relevant to the design, development and evaluation of programmed solutions to problems;
- develop a range of practical skills relevant to the design, development and evaluation of programmed solutions to problems;
- develop a range of transferable skills including communication, logical presentation of ideas and arguments, and independent and team working; and practice these skills within the context of their studies;
- recognise and begin to appreciate the legal, social, ethical and professional issues involved in the application of their knowledge and skills to a range of problems; and
- provide students with a broad range of activities drawn from a variety of problem domains.

For the Computer Science awards, the programme additionally aims, at a high level, to provide students with opportunities to:

- develop specific in-depth technical abilities and skills that are relevant to the design, development, evaluation and management of computational systems; and
- develop a broad understanding of, and practical abilities in, a range of computing disciplines.

For the Information Technology award, the programme additionally aims, at a high level, to provide students with opportunities to:

- develop specific in-depth technical abilities and skills that are relevant to the design, development, configuration and operation of computing-based systems that support information handling and decision making; and
- develop a broad understanding of, and practical abilities in, a range of computing disciplines.

Additionally, for either the Computer Science with a Study/Year Abroad award or the Information Technology with a Study/Year Abroad awards, the programme aims to provide students with opportunities to:

- develop understanding of the appropriate subject domain topics within the context of a non-United Kingdom cultural environment; and
- gain experience of developing appropriate solutions drawn from a variety of problem domains in the context of non-United Kingdom cultural environment.

For the specialist awards in Computer Science, students will acquire a deeper understanding and more specific skills relevant to a particular domain, and the generic aims can be further refined as follows:

For the Computer Science (Software Engineering) specialist award, the programme aims to provide students with opportunities to:

- develop the ability to choose suitable tools and techniques for software development depending on the characteristics of the problem;
- develop an appreciation of good practice in the management of software development;
- develop an appreciation of software development as an engineering discipline;
- develop a responsible and professional attitude to the quality and timeliness of their products; and
- develop an appreciation of the role of theory in practical applications.

For the Computer Science (Cyber Security and Networks) specialist award, the programme aims to provide students with opportunities to:

- develop a knowledge of the function of both hardware and software aspects of networked systems;
- gain an understanding of the principles of operation of a wide variety of network technologies;
- develop an appreciation of how network services are developed and a knowledge of their uses;
- gain an understanding of the special problems of the development networked systems, including design, implementation, validation and testing.
- develop an appreciation of the necessity to protect computing and communication resources from security threats at all levels: systems, software and networks.
- gain an understanding of security counter-measures, such as firewalls and intrusion detection systems.

For the Computer Science (Artificial Intelligence) specialist award, the programme aims to provide students with opportunities to:

- gain an understanding of the theoretical basis of Artificial Intelligence;
- acquire the software engineering skills necessary for the design, implementation and testing of Artificial Intelligence systems;
- acquire the requisite mathematical and modelling skills to engineer Artificial Intelligence systems;
- gain experience of a range of applications of Artificial Intelligence and an understanding of their suitability to a range of problem domains.

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## C. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced to the QAA benchmark statements for Computing and the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (2014) and relate to the typical student. Additionally, the SEEC Credit Level Descriptors for Further and Higher Education (2021) have been used as a guiding framework for curriculum design.

Knowledge and Understanding | Teaching and learning methods | Assessment strategy

A1- The methodology of developing programmed solutions and a subset of the tools, notations and techniques appropriate to the various stages of development, from problem identification to system implementation and evaluation.

A2- The complexity of interactions between agents, which could be human or programmed systems, at various levels, and the implications of this for the developer of a programmed solution.

A3- The context within which a professional software designer operates and implications for professional practice including the legal, social, ethical and professional issues involved.

**Additionally for BSc Computer Science (CS) and specialist CS awards**

A4- An in-depth understanding of principles and practices relevant to the design and development of programmed systems and their subsequent use in specific contexts.

**Additionally for Information Technology (IT) award**

A5- An in-depth understanding of principles and practices relevant to the design, development, configuration and operation of information technology systems and their subsequent use in specific contexts.

**Additionally for Computer Science (Software Engineering) award**

A6- An in-depth understanding of principles and practices relevant to the specification, design, implementation and

At level 4, A1–A5 are introduced via specific topics using a combination of lectures, tutorials, practical classes, online material, and guided self- study. The material is integrated via the core theme of programmed system design, and students will be helped to appreciate these topics within this framework.

Tasks will in general concentrate on building proficiency and confidence at the topic level, and students will not be expected to work at the systems level without considerable support. It is at level 5 that the main routes of computer science and information technology distinguish themselves, and therefore the respective knowledge and understanding (for A4 and A5) begins to diverge.

At level 5, for both routes, additional topics addressing A1–A5 will be introduced using lectures, tutorials, practical classes, online material and guided self- study, and students will be expected to begin to integrate material and adopt a more critical and analytical attitude to their learning, and to the topics and tasks being taught.

The learning opportunities will provide insight into the range of options available for solving design problems and therefore into the selection of appropriate methodological and system components, as well as of their evaluation.

Level 5 provides the opportunity for computer science students to begin to specialise their knowledge and understanding for A1, A2, and A6, A7 and A8.

At level 4, A1 – A5 are assessed through a combination of primarily coursework and in-class tests, with some unseen examinations. Where appropriate assessments will also include a component of peer assessment by students. Assessments concentrate on specific topics, within a provided framework, rather than on substantive integrative tasks.

At level 5, A1 – A5 will be assessed through a more 'balanced' combination of coursework, in-class tests, and unseen examinations. Where appropriate assessments will also include a component of peer assessment by students. Assessments will begin to include more substantial elements of teamwork and project work and, through those, more substantive assessment tasks.

Students passing the four level 4 core modules together with the appropriate level 5 core modules will be deemed to have met the minimum threshold level in A1 – A5 necessary to progress to examination for an Honours award.

At level 6, A1 – A8 will again be assessed through a combination of coursework, in-class test and unseen examinations; with again the opportunity for peer assessment where appropriate. There will be a substantial component of individual project-type activity, for which students will be expected to: establish for themselves the framework within which the work is carried out; select and apply knowledge and understanding as appropriate to the specific problem(s) being addressed; and evaluate solutions, referencing appropriate research or scholarship.

At level 6, A3 may additionally be assessed through the professional placement.

evaluation of programmed systems.

**Additionally for Computer Science (Cyber Security and Networks) award**

A7- An in-depth understanding of principles and practices relevant to evaluating and improving the security of systems, including threats and countermeasures. This includes in-depth understanding of principles and practices relevant to the design, implementation and evaluation of computer networks and systems operating in a networked environment.

**Additionally for Computer Science (Artificial Intelligence) award**

A8- An in-depth understanding of principles and practices relevant to the specification, design, implementation and evaluation of mechanisms enabling intelligence of various kinds in humans, robots and information processing systems.

A3 will be addressed explicitly via lectures, tutorials, online material and guided self-study on specific topics.

The professional work placement provides the opportunity to contextualise A1, A2, A4 and A5 in a working environment, and to develop A3 through interaction with professionals in the discipline.

At level 6, learning relating to A1–A8 is expected to be increasingly independent, critical and evaluative; and students are expected to take increasing responsibility for the selection and use of theories, principles and methods in particular contexts, and for tackling particular problems. This understanding is expected to include an appreciation of the limits of applicability of theories, the uncertainty and inherent open-endedness of many practical problems in computing and of the human and societal constraints on approaches to problem solution. Some material will be presented via lectures, tutorials, practical classes and online, with significant learning undertaken and achieved through independent, self-directed study.

Students at all levels of the programme are expected to continue their development in A3 outside of their formal studies as they start to consider their future careers, and they will be supported in this by a range of activities such as research seminars, talks from professional bodies and careers talks and advice.

At all levels of the programme, students are encouraged to undertake independent study both to supplement and consolidate what is being taught/learnt and to broaden

	their individual knowledge and understanding of the subject.	
Intellectual skills	Teaching and learning methods	Assessment strategy
Not applicable under QAA Benchmarking statement. Intellectual skills are subsumed under Knowledge and Understanding.	Not applicable under QAA Benchmarking statement. Intellectual skills are subsumed under Knowledge and Understanding.	Not applicable under QAA Benchmarking statement. Intellectual skills are subsumed under Knowledge and Understanding.
Practical skills	Teaching and learning methods	Assessment strategy
<p>C1- Use specific tools, techniques, notations and methods in the context of the design and development of programmed computer systems.</p> <p>C2- Use computer systems and associated technology to support the development of programmed systems.</p> <p>C3- Engage in effective discussion of technical information as appropriate to the system design and development task.</p> <p>C4- Carry out design activities ranging from initial problem identification to system implementation and evaluation, and as an individual or participate as a member of a team carrying out a subset of these activities.</p>	<p>Level 4, 5 and 6 will address C1 – C3 using lectures and tutorials for the presentation of instructional material, with practical classes, independent study and project work offering the opportunity to practise the skills in a supportive environment. The amount of instructional material will decrease as the programme progresses, with students being expected to take an increasing responsibility for developing their own skills and identifying resources to support their development.</p> <p>Level 4, 5 and 6 will address C4. The examples used at level 4 will be simple, and considerable support will be given in problem identification and evaluation. At levels 5 and 6 this support will be increasingly reduced, and more open tasks will be set. Students</p>	<p>At level 4 practical skills C1 and C2 will be assessed directly through coursework and assessed indirectly through unseen examinations and in-class tests. The examinations and in-class tests will assess understanding that has developed, or been consolidated, as a result of practical activity.</p> <p>At level 5, C3 and C4 are assessed, through a group design task.</p> <p>At level 6, C1 – C6 will be assessed directly and indirectly. The independent project at level 6 will assess C4 – C6.</p> <p>Typically, students passing the five level 4 core modules together with the appropriate level 5 core modules will be deemed to have met the minimum threshold level in C1 – C6 necessary to progress to examination for an Honours award.</p>

<p><b>Additionally for BSc Computer Science (CS) and specialist CS awards</b> C5- Design, implement and evaluate systems as characterised by Computer Science approaches, methodologies and practices.</p> <p><b>Additionally for BSc Information Technology (IT) awards</b> C6- Configure, evaluate the performance of, and protect from cyber security threats information technology systems.</p>	<p>will be exposed to employ a variety of technologies such as operating environments, programming languages, applications and specification techniques.</p> <p>At level 6 students will be expected to extend their skills developed in C1–C6 to the task of evaluating and selecting appropriate approaches to addressing specific tasks appropriate to that level.</p> <p>The industrial placement period offers enhanced opportunities for developing either a wider range of skills, or developing specific skills to higher levels of proficiency.</p> <p>For BSc students, C1 – C6 are further developed and deepened through an individual self-managed project at level 6.</p> <p>Throughout the levels of the programme, the learner is encouraged to further develop their practical skills by independent study.</p>	
<p><b>Transferable skills</b></p> <p>D1- Communicate effectively orally, in writing and visually using the conventions, vocabulary, form and register of academic expression.</p> <p>D2- Manage their own learning including time management, the organization and retrieval of information, and the identification of personal needs for continuing professional development.</p> <p>D3- Select and use a variety of modes of discourse, including mathematical, informal and diagrammatic.</p> <p>D4- Work effectively both independently and as part of a team.</p>	<p><b>Teaching and learning methods</b></p> <p>Transferable skills are developed through using a variety of teaching and learning methods and strategies.</p> <p>Students are expected to take an increasing responsibility for their own learning as the programme progresses, and are supported in meeting D1 through tutoring and guided independent study using resources provided both locally and centrally (e.g. the Learning Resources Centre runs sessions and produces self-study guides on information retrieval and similar topics).</p> <p>The development of confidence and ability to use more formal, mathematical, modes is addressed at level 4 explicitly. Central support, such as the</p>	<p><b>Assessment strategy</b></p> <p>Transferable skills are assessed through Transferable skills are assessed through a variety of means built into the curriculum.</p> <p>At level 4, 5 and 6, D1 is assessed in different ways e.g. a short report at level 4, a team presentation at level 5, an individual presentation at level 6.</p> <p>At level 4, 5 and 6, D2 is assessed by setting different kinds of task, providing feedback on those tasks to students (partly through peer assessment) and encouraging reflection by students.</p> <p>At level 4, 5 and 6, D3 is assessed in different ways, depending on the topic and the nature of the assessment. Additionally, the independent project at level 6 provides opportunities for</p>



D5- Reflect upon their work and the work of others, and explain, justify and otherwise defend their work and ideas, with reference to academic, professional issues, debates and conventions.

Mathematics drop-in centre and courses on written and spoken English, are available for students having particular difficulties in meeting aspects of D2. Students are encouraged to form study groups at level 4, and to start building a collaborative attitude towards studying, whilst also taking responsibility for their own learning.

All courses include a level 4 Team Project. At level 5, team-working is used explicitly in the context of a development task, and students will be supported in meeting D3 through this.

The industrial placement offers the opportunity to address D1 – D5.

At level 6, the project addresses D1 – D5, together with the independent aspects of D4. D5 is developed through exposure to contemporary issues at level 6 and beyond.

During the course of the programme, assessed and non-assessed work encourages the learner to develop a wide range of transferable skills. In level 4, this starts with closely defined and directed assignments. At level 5 the learner is encouraged by more loosely defined projects and at level 6 these are supported through the self-definition of work in the project.

students to select appropriate modes of discourse for the problem(s) they are seeking to address.

Students' ability to work independently (D4) is assessed throughout the programme via individual coursework assignments, culminating in the major individual project at Level 6. Their ability to work as part of a team (also D4) is assessed at Levels 4 and 5 via two substantial teamwork exercises.

At level 6, for BSc students, D4 is assessed through the individual project.

D5 is assessed by reviewing the outcomes of assignments, and additionally through peer assessment, where appropriate e.g. Level 4 and 5 team projects. At level 6, D5 is assessed as part of the individual project.

The programme provides opportunities for students to develop all of the University's Graduate Attributes i.e.

- Professionalism, employability and enterprise
- Learning and research skills
- Intellectual depth, breadth and adaptability
- Respect for others
- Social responsibility
- Global awareness

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## D. Programme Structures, Features, Levels, Modules, and Credits

The programme is offered in

- BSc full-time (3 years)
- BSc sandwich (4 years)
- BSc year abroad (4 years)
- BSc sandwich with study abroad (4 years)

Entry is normally at level 4, but entry is also possible at level 5 or at level 6 with appropriate entry qualifications (see further information in section F). Intake is normally in Semester A (September).

Once a student has progressed to Level 5, they have made the decision to study on the Information Technology route or on the Computer Science route and cannot transfer between the two routes.

Students on the Computer Science route elect to follow one of four pathways but may transfer between these pathways before they progress to Level 6.

### Professional and Statutory Regulatory Bodies

The following awards have been accredited by BCS, The Chartered Institute for IT:

- BSc Honours in Computer Science
- BSc Honours in Computer Science (Artificial Intelligence)
- BSc Honours in Computer Science (Cyber Security and Networks)
- BSc Honours in Computer Science (Software Engineering)
- BSc Honours in Information Technology

Accreditation is a mark of assurance that the degree meets the standards set by BCS. An accredited degree entitles you to professional membership of BCS, which is an important part of the criteria for achieving Chartered IT Professional (CITP) status through the Institute.

### Work-Based Learning, including Sandwich Programmes

An award in the sandwich mode is made to a student who has successfully completed the requirements for a full-time award, and also successfully completed at least 30 weeks of approved, supervised work experience. Students are supported by the Careers and Employment Service in finding a placement.

The placement takes place between Level 5 and Level 6 of the programme.

### Study Abroad

An award in the “Year Abroad” mode is made to a student who has successfully completed the requirements for a full-time BSc award, and also successfully completed a two-semester programme of study at a partner institution in a non-UK country, as organised and approved by the University’s Study Abroad Office. The Year Abroad occurs between Level 5 and Level 6 of the programme and typically takes place over Semester A and Semester B.

The programme of study for the Year Abroad mode will be negotiated and approved by the Study Abroad Office in consultation with appropriate others, such as the Programme Leader (or equivalent) and the appropriate representative at the hosting institution. The programme provided by the host institution may consist of (for example): taught modules, a research project, field studies, or a mixture of these components. Prior to starting the Year Abroad, the student and programme officers from UH and the host institution will agree a learning contract and mode of assessment for the study at the hosting institution.

## **Programme Structure**

There are two principal routes through the programme: one leading to BSc (Hons) awards in Computer Science and the other leading to BSc (Hons) awards in Information Technology.

There are four pathways through the Computer Science route: one leading to the award of a BSc (Hons) Computer Science, a second leading to the award of a BSc (Hons) Computer Science (Artificial Intelligence), a third leading to the award of a BSc (Hons) Computer Science (Cyber Security and Networks) and a fourth leading to the award of a BSc (Hons) Computer Science (Software Engineering). The Information Technology route has a single pathway, leading to the award of a BSc (Hons) Information Technology.

Students who fail to meet certain programme-specific requirements at Level 4 may be transferred to a third route, leading to a BSc (Hons) Computer Studies, upon progression to Level 5. Transfer back to the Computer Science or Information Technology route is available to those who redeem the relevant Level 4 failure(s).

The programme structure and progression information below (Table 1a and 1b) is provided for the Honours award. Any interim awards are identified in Table 1b. The Programme Learning Outcomes detailed above are developed and assessed through the constituent modules. Table 2 identifies where each learning outcome is assessed.

All optional modules are offered subject to timetable availability and other operational constraints. This programme specification does not commit the School to make optional modules available to students choosing to take a module as an option.

**Table 1a Outline Programme Structure: BSc Honours in Information Technology**

**Mode of study:** Full-time

**Entry point:** Semester A

**Level 4**

<b>Compulsory Modules (all awards)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Introduction to Programming and Discrete Structures	4COM2002	30	0	100	0	A
Data Modelling for Databases	4COM2004	15	50	50	0	A
From Silicon to C	4COM2003	30	0	100	0	AB
Computational Problem Solving	4COM2005	30	0	100	0	B
Team Software Project	4COM2006	15	0	100	0	B

**Level 4 modules for Hertfordshire International College (HIC) students**

<b>Compulsory Modules (all awards)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Introduction to Programming and Discrete Structures (HIC)	4COM2007	30	English	0	100	A
From Silicon to C (HIC)	4COM2008	30	English	0	100	AB
Data Modelling for Databases (HIC)	4COM2009	15	English	50	50	A
Computational Problem Solving (HIC)	4COM2010	30	English	0	100	B
Team Software Project (HIC)	4COM2011	15	English	0	100	B

**Level 5**

<b>Compulsory Modules</b> <b>BSc Honours in Information Technology</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Accessibility and Usability	5COM2002	15	0	100	0	A
Database Systems	5COM2005	15	50	50	0	A
Web Application Development and Deployment	5COM2009	30	0	100	0	A
Design and Configuration Project	5COM2006	30	0	100	0	B
Systems and Network Administration	5COM2008	30	0	100	0	B

## Level 6

<b>Optional Modules (to be studied between the second and final year) (all awards)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Professional Work Placement in Computer Science	6COM0244	0	0	P/F	0	AB
Computer Science – Year Abroad	6COM1058	0	0	P/F	0	AB
Computer Science – Study Abroad	6COM1059	0	0	P/F	0	A or B

<b>Compulsory Modules BSc Honours in Information Technology</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Responsible Computing	6COM2010	15	0	100	0	B
Cloud Computing	6COM2002	15	0	100	0	A
Computer Systems Security	6COM1033	15	0	100	0	A
Data Mining and Visualisation	6COM2005	30	0	100	0	AB
Information Technology Project	6COM2020	30	0	90	10	AB

<b>Optional Modules (all awards)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Machine Learning and Neural Computing	6COM1044	15	0	100	0	B
Advanced Database Topics	6COM1048	15	50	50	0	B
Information Security Management	6COM1050	15	0	100	0	B
Robotics	6COM2011	15	0	100	0	B

**Table 1a Outline Programme Structure:**  
**BSc Honours in Computer Science**  
**BSc Honours in Computer Science (Artificial Intelligence)**  
**BSc Honours in Computer Science (Cyber Security and Networks)**  
**BSc Honours in Computer Science (Software Engineering)**

**Mode of study:** Full-time

**Entry point:** Semester A

**Level 4**

	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
<b>Compulsory Modules (all awards)</b>						
<b>Module Title</b>						
Data Modelling for Databases	4COM2004	15	50	50	0	A
Introduction to Programming and Discrete Structures	4COM2002	30	0	100	0	A
From Silicon to C	4COM2003	30	0	100	0	AB
Computational Problem Solving	4COM2005	30	0	100	0	B
Team Software Project	4COM2006	15	0	100	0	B

**Level 4 modules for Hertfordshire International College (HIC) students**

	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
<b>Compulsory Modules (all awards)</b>						
<b>Module Title</b>						
Data Modelling for Databases (HIC)	4COM2009	15	English	50	50	A
Introduction to Programming and Discrete Structures (HIC)	4COM2007	30	English	0	100	A
From Silicon to C (HIC)	4COM2008	30	English	0	100	AB
Computational Problem Solving (HIC)	4COM2010	30	English	0	100	B
Team Software Project (HIC)	4COM2011	15	English	0	100	B

## Level 5

<b>Compulsory Modules (all Computer Science awards)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Accessibility and Usability	5COM2002	15	0	100	0	A
Database Systems	5COM2005	15	50	50	0	A
Algorithms and Data Structures	5COM1054	15	85	15	0	A
Principles and Practices of Large-Scale Programming	5COM2007	30	0	100	0	AB
Artificial Intelligence	5COM2003	15	50	50	0	B
Computing Things	5COM2004	15	0	100	0	B
Operating Systems and Networks	5COM1055	15	0	100	0	B

## Level 6

<b>Optional Modules (to be studied between the second and final year) (all awards)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Professional Work Placement in Computer Science	6COM0244	0	0	P/F	0	AB
Computer Science – Year Abroad	6COM1058	0	0	P/F	0	AB
Computer Science – Study Abroad	6COM1059	0	0	P/F	0	A or B

<b>Compulsory Modules BSc Honours in Computer Science</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Internet of Things	6COM2008	15	50	50	0	A
Real-time and Control Systems	6COM2009	15	0	100	0	A
Software Architecture	6COM2013	15	0	100	0	A
Mobile Computing	6COM1047	15	0	100	0	B
Responsible Computing	6COM2010	15	0	100	0	B
Computer Science Project	6COM2018	30	0	90	10	AB

<b>Compulsory Modules BSc Honours in Computer Science (Artificial Intelligence)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Advanced Artificial Intelligence	6COM2000	15	0	100	0	A
Social and Collective Artificial Intelligence	6COM2012	15	0	100	0	A
Software Architecture	6COM2013	15	0	100	0	A
Intelligent Adaptive Systems	6COM2007	15	0	100	0	B
Responsible Computing	6COM2010	15	0	100	0	B
Artificial Intelligence Project	6COM2017	30	0	90	10	AB

<b>Compulsory Modules BSc Honours in Computer Science (Cyber Security and Networks)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Cyber Security	6COM1040	15	75	25	0	A
Incident Response Digital Forensics	6COM2006	15	0	100	0	A
Software Architecture	6COM2013	15	0	100	0	A
Network Protocols and Architectures	6COM1039	15	0	100	0	B
Responsible Computing	6COM2010	15	0	100	0	B
Cyber Security and Networks Project	6COM2019	30	0	90	10	AB

<b>Compulsory Modules BSc Honours in Computer Science (Software Engineering)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Software Architecture	6COM2013	15	0	100	0	A
Software Engineering Techniques	6COM2014	15	0	100	0	A
Software Quality	6COM2015	15	0	100	0	A
Advanced Programming Paradigms	6COM2001	15	0	100	0	B
Responsible Computing	6COM2010	15	0	100	0	B
Software Engineering Project	6COM2021	30	0	90	10	AB

<b>Optional Modules</b> Module Title Select 15 credits	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Machine Learning and Neural Computing	6COM1044	15	0	100	0	B
Advanced Database Topics	6COM1048	15	50	50	0	B
Information Security Management	6COM1050	15	0	100	0	B
Robotics	6COM2011	15	0	100	0	B



**For all awards, progression to Level 5 requires a minimum of 90 credits including a pass in Introduction to Programming and Discrete Structures 4COM2002/ Introduction to Programming and Discrete Structures (HIC) 4COM2007.**

Students who have failed 4COM2002/4COM2007 and wish to progress to Level 5 will be transferred to the BSc (Hons) Computer Studies route, and will not continue on either the Computer Science route or the Information Technology route. If they pass 4COM2002/4COM2007 on re-enrolment before they progress to Level 6, they may return to the route for which they have prepared at Level 5.

Students who passed a minimum of 90 credits including a pass in 4COM2002/4COM2007 will progress to Level 5.

Students who progress to Level 5 with 15- or 30-credit shortages, will study the online equivalents of the Level 4 modules they have failed previously.

<b>Compulsory Modules (all awards)</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Data Modelling for Databases (equivalent to 4COM2004)	4WCM2002	15	0	100	0	B
From Silicon to C (equivalent to 4COM2003)	4WCM2004	30	50	50	0	B
Computational Problem Solving (COM) (equivalent to 4COM2005)	4WCM2000	30	0	100	0	A
Team Software Project (equivalent to 4COM2006)	4WCM2010	15	0	100	0	B

**Table 1a Outline Programme Structure: BSc (Hons) Computer Studies**

**Mode of study:** Full-time

**Level 4**

<b>Compulsory Module</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Introduction to Programming and Discrete Structures	4COM2002	30	0	100	0	A

**Level 5**

Level 5 modules for those on the BSc (Hons) Computer Studies route who intend to return to **Information Technology** at Level 6.

<b>Compulsory Modules</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Accessibility and Usability	5COM2002	15	0	100	0	A
Database Systems	5COM2005	15	50	50	0	A
Web Application Development and Deployment	5COM2009	30	0	100	0	A
Design and Configuration Project	5COM2006	30	0	100	0	B
Systems and Network Administration	5COM2008	30	0	100	0	B

Level 5 modules for those on the BSc (Hons) Computer Studies route who intend to return to **Computer Science** at Level 6.

<b>Compulsory Modules</b> Module Title	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
Accessibility and Usability	5COM2002	15	0	100	0	A
Database Systems	5COM2005	15	50	50	0	A
Algorithms and Data Structures	5COM1054	15	85	15	0	A
Principles and Practices of Large-Scale Programming	5COM2007	30	0	100	0	AB
Artificial Intelligence	5COM2003	15	50	50	0	B
Computing Things	5COM2004	15	0	100	0	B
Operating Systems and Networks	5COM1055	15	0	100	0	B

**Notes:** Computer Studies students do **NOT** take the final year project. Instead, they are required to complete a Technical Report that does not require a practical component. Students on a Level 6 Computer Studies course instance will have an unredeemed failure in 4COM2002/4COM2007, typically with an FNFA status

code.

	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
<b>Compulsory Modules</b>						
Module Title						
Computer Systems Security	6COM1033	15	0	100	0	A
Software Architecture	6COM2013	15	0	100	0	A
Responsible Computing	6COM2010	15	0	100	0	B
Computer Studies Technical Report	6COM2003	30	0	100	0	AB
Data Mining and Visualisation	6COM2005	30	0	100	0	AB

	Module Code	Credit Points	% Examination	% Coursework	% Practical	Semesters
<b>Optional Modules (all awards)</b>						
Module Title						
Machine Learning and Neural Computing	6COM1044	15	0	100	0	B
Advanced Database Topics	6COM1048	15	50	50	0	B
Information Security Management	6COM1050	15	0	100	0	B
Robotics	6COM2011	15	0	100	0	B

**The award of a BSc (Honours) degree requires 360 credit points with a minimum of at least 120 at level six including the final year project for the Computer Science and Information Technology awards and the technical report for the Computer Studies award.**

### Honours classification

The University has approved structure and assessment regulations common to all programmes. Full details are provided in [UPR AS14](#), Section D.

**Table 1b Final and interim awards available**

The programme provides the following final and interim awards:

Final Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
BSc (Hons)	BSc Honours in Computer Science	360 credit points including 240 at level 6/5 of which 120 must be at level 6, and include a pass in the individual project module.	6	All programme learning outcomes for the award (see Table 2).
	BSc Honours in Computer Science (Artificial Intelligence)			
	BSc Honours in Computer Science (Cyber Security and Networks)			
	BSc Honours in Computer Science (Software Engineering)			
	BSc Honours in Information Technology			
BSc (Hons)	BSc Honours in Computer Science (Sandwich)	360 credit points including 240 at level 6/5 of which 120 must be at level 6, and include passes in the individual project module and Professional Work Placement in Computer Science 6COM0244.	6	All programme learning outcomes for the award (see Table 2).
	BSc Honours in Computer Science (Artificial Intelligence) (Sandwich)			
	BSc Honours in Computer Science (Cyber Security and Networks) (Sandwich)			
	BSc Honours in Computer Science (Software Engineering) (Sandwich)			
	BSc Honours in Information Technology (Sandwich)			

BSc (Hons)	<p>BSc Honours in Computer Science (Year Abroad)</p> <p>BSc Honours in Computer Science (Artificial Intelligence) (Year Abroad)</p> <p>BSc Honours in Computer Science (Cyber Security and Networks) (Year Abroad)</p> <p>BSc Honours in Computer Science (Software Engineering) (Year Abroad)</p> <p>BSc Honours in Information Technology (Year Abroad)</p>	<p>360 credit points including 240 at level 6/5 of which 120 must be at level 6, and include passes in the individual project module and Computer Science - Year Abroad 6COM1059.</p>	6	All programme learning outcomes for the award (see Table 2).
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Interim Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
University Certificate		45 credit points at level 4	4	See UPR AS11, section 13: <a href="http://sitem.herts.ac.uk/secreg/upr/AS11.htm">http://sitem.herts.ac.uk/secreg/upr/AS11.htm</a>
Certificate of Higher Education		120 credit points at level 4	4, 5	See UPR AS11, section 13: <a href="http://sitem.herts.ac.uk/secreg/upr/AS11.htm">http://sitem.herts.ac.uk/secreg/upr/AS11.htm</a>
Diploma of Higher Education	Diploma of Higher Education in Computer Science	240 credit points including at least 120 at level 5	5, 6	A subset of the programme learning outcomes (see Table 2) depending on the student's individual modules passed.
Diploma of Higher Education	Diploma of Higher Education in BSc Information Technology	240 credit points including at least 120 at level 5	5, 6	A subset of the programme learning outcomes (see Table 2) depending on the student's individual modules passed.
BSc	<p>BSc Computer Science</p> <p>BSc Information Technology</p>	300 credit points including 180 at level 6/5 of which 60 must be at level 6.	6	A subset of the programme learning outcomes (see Table 2) depending on the student's individual modules passed.
BSc	BSc Honours in Computer Studies	360 credit points including 180 at level 6/5, of which 90 must be at level 6.	6	A subset of the programme learning outcomes (see Table 2) depending on the student's individual modules passed.

BSc (Hons)	<p>BSc Honours in Computer Science (Study Abroad)</p> <p>BSc Honours in Computer Science (Artificial Intelligence) (Study Abroad)</p> <p>BSc Honours in Computer Science (Cyber Security and Networks) (Study Abroad)</p> <p>BSc Honours in Computer Science (Software Engineering) (Study Abroad)</p> <p>BSc Honours in Information Technology (Study Abroad)</p>	<p>360 credit points including 240 at level 6/5 of which 120 must be at level 6, and include passes in the individual project module and Computer Science - Study Abroad 6COM1058.</p>	6	All programme learning outcomes for the award (see Table 2).
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## Programme-specific assessment regulations

The programme complies with the University's academic regulations (in particular, [UPR AS11](#), [UPR AS12](#) and [UPR AS14](#)) with the exception of those listed below, which have been approved by the University:

- In line with BCS accreditation requirements, the following individual project modules cannot be compensated: Artificial Intelligence Project 6COM2017, Computer Science Project 6COM2018, Cyber Security and Networks Project 6COM2019, Information Technology Project 6COM2020, Software Engineering Project 6COM2021.
- The maximum period within which a student may gain an award on the programme is eight years from the student's first date of registration on it.

Course Code	Course Instance	Award Title	Modules (child instance codes & title)	Must be included in
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				classification algorithm?
CMCSITBSC	CMS3F CMS4S	BSc Honours in Computer Science BSc Honours in Computer Science (Sandwich) BSc Honours in Computer Science (Year Abroad)	Computer Science Project 6COM2018	<i>no</i>
CMCSITBSC	CMSAI3F CMSAI4S	BSc Honours in Computer Science (Artificial Intelligence) BSc Honours in Computer Science (Artificial Intelligence) (Sandwich) BSc Honours in Computer Science (Artificial Intelligence) (Year Abroad)	Artificial Intelligence Project 6COM2017	<i>no</i>
CMCSITBSC	CMSCN3F CMSCN4S	BSc Honours in Computer Science (Cyber Security and Networks) BSc Honours in Computer Science (Cyber Security and Networks) (Sandwich) BSc Honours in Computer Science (Cyber Security and Networks) (Year Abroad)	Cyber Security and Networks Project 6COM2019	<i>no</i>
CMCSITBSC	CMSSE3F CMSSE4S	BSc Honours in Computer Science (Software Engineering) BSc Honours in Computer Science (Software Engineering) (Sandwich) BSc Honours in Computer Science (Software Engineering) (Year Abroad)	Software Engineering Project 6COM2021	<i>no</i>
CMCSITBSC	IFT3F IFT4S	BSc Honours in Information Technology BSc Honours in Information Technology (Sandwich) BSc Honours in Information Technology (Year Abroad)	Information Technology Project 6COM2020	<i>no</i>

Further programme-specific regulations (requiring School-level approval) are given below:

- For all awards, progression to Level 5 requires a minimum of 90 credits including a pass in Introduction to Programming and Discrete Structures 4COM2002/ Introduction to Programming and Discrete Structures (HIC) 4COM2007.
- Students who have failed 4COM2002/4COM2007 and who wish to progress to Level 5 will be transferred to the BSc (Hons) Computer Studies route, and will not continue on either the Computer Science route or the Information Technology route. If they pass 4COM2002/4COM2007 on re-enrolment before they progress to Level 6, they may return to the route for which they have prepared at Level 5.
- For all awards, progression to Level 6 requires a minimum of 210 credit points of compulsory modules at Levels 4 and 5, including 90 credit points at Level 5 and a pass in 4COM2002/4COM2007.
- The following modules cannot be compensated: Professional Work Placement in Computer Science 6COM0244, Computer Science - Year Abroad 6COM0291, Computer Science - Study Abroad 6COM1058.

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## E. Management of Programme & Support for student learning.

### **Management**

The programme is managed and administered through:

- The Programme Leader, who is responsible for advising students on the programme as a whole and chairing the programme committee;
- Student representatives on programme committees;
- Module Leaders;
- A designated administrative team to deal with day-to-day administration associated with the modules within the programme.

### **Support**

Students are supported by:

- An induction week at the beginning of each new academic session.
- Overseas Orientation.
- A nominated member of academic staff who will be an important point of contact, able to help you gain a good understanding of the School and programme you are studying.
- A substantial Student Centre that provides advice on issues such as finance, University regulations, legal matters, accommodation, international student support, etc.
- Office of Dean of Students, Student Wellbeing (incorporating Counselling, Mental Health and Disability Support), Chaplaincy, and Day Nursery.
- A versatile on-line inter-active intranet and learning environment.
- Guided student-centred learning on Canvas module sites.
- Access to extensive digital and print collections of information resources.
- Attractive modern study environments in 3 Learning Resources Centres.
- Student Success Hubs, which include a Mathematics Drop-in Centre.
- Medical Centre.
- University Disability Advisors.
- Careers and Employment.
- Hertfordshire Student's Union.
- Dedicated programme site.

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## F. Other sources of information

In addition to this Programme Specification, the University publishes guidance to registered students on the programme and its constituent modules:

- A Programme (or Student) Handbook;
- A Definitive Module Document (DMD) for each constituent module;

The [Ask Herts](#) website provides information on a wide range of resources and services available at the University of Hertfordshire including academic support, accommodation, fees, funding, visas, wellbeing services and student societies.

As a condition of registration, all students of the University of Hertfordshire are required to comply with the University's rules, regulations and procedures. These are published in a series of documents called 'University Policies and Regulations' (UPRs). The University requires that all students consult these documents which are available on-line, on the UPR web site, at: <http://www.herts.ac.uk/secreg/upr/>. In particular, [UPR SA07](#) 'Regulations and Advice for Students' Particular Attention - Index' provides information on the UPRs that contain the academic regulations of particular relevance for undergraduate and taught postgraduate students.



In accordance with section 4(5) of the Higher Education and Research Act 2017 (HERA), the UK Office for Students (OfS) has registered the University of Hertfordshire in the register of English higher education providers. The Register can be viewed at: <https://www.officeforstudents.org.uk/advice-and-guidance/the-register/the-ofs-register/>.

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## **G. Entry requirements**

For current entry tariff point requirements, please refer to the relevant page for the Course on the University website or on the online prospectus.

The programme is subject to the University's Principles, Policies and Regulations for the Admission of Students to Undergraduate and Taught Postgraduate Programmes (in [UPR SA03](#)), along with associated procedures. These will take account of University policy and guidelines for assessing accredited prior certificated learning (APCL) and accredited prior experiential learning (APEL).

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If you would like this information in an alternative format, please contact: [hhaq@herts.ac.uk](mailto:hhaq@herts.ac.uk)

If you wish to receive a copy of the latest External Examiner's Report for the programme, please email a request to [aqo@herts.ac.uk](mailto:aqo@herts.ac.uk)

**Table 2: Development of Intended Programme Learning Outcomes in the Constituent Modules**

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

Level	Module Title	Module Code	Compulsory (C) or Optional (O)	Knowledge and Understanding								Practical Skills						Transferable Skills				
				A1	A2	A3	A4	A5	A6	A7	A8	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5
L4	Introduction to Programming and Discrete Structures	4COM2002	C(All)	X	X							X	X		X				X	X	X	
	Data Modelling for Databases	4COM2004	C(All)	X	X		X					X	X		X			X	X	X	X	
	Computational Problem Solving	4COM2005	C(All)	X	X							X	X		X				X	X	X	
	Team Software Project	4COM2006	C(All)	X	X	X						X	X	X	X	X	X	X	X	X	X	X
	From Silicon to C	4COM2003	C(All)	X	X							X	X		X				X		X	
L5	Accessibility and Usability	5COM2002	C(All)	X	X	X						X		X	X			X	X	X	X	
	Database Systems	5COM2005	C(All)	X		X	X					X		X		X		X	X		X	
	Algorithms and Data Structures	5COM1054	C(AI,CN,CS,SE)	X			X					X			X	X						
	Operating Systems and Networks	5COM1055	C(AI,CN,CS,SE)		X		X					X			X	X						
	Computing Things	5COM2004	C(AI,CN,CS,SE)	X			X					X						X	X	X	X	
	Artificial Intelligence	5COM2003	C(AI,CN,CS,SE)	X	X						X	X	X		X			X	X			
	Principles and Practices of Large-Scale Programming	5COM2007	C(AI,CN,CS,SE)	X	X	X	X		X			X	X	X	X	X		X	X	X	X	X
	Web Application Development and Deployment	5COM2009	C(IT)	X	X	X		X				X	X	X	X	X	X	X	X	X	X	X
	Systems and Network Administration	5COM2008	C(IT)	X	X			X			X	X				X		X		X	X	
Design and Configuration Project	5COM2006	C(IT)	X	X	X		X				X		X			X	X	X	X	X	X	

Level	Module Title	Module Code	Compulsory (C) or Optional (O)	Knowledge and Understanding								Practical Skills						Transferable Skills				
				A1	A2	A3	A4	A5	A6	A7	A8	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5
L6	Professional Work Placement in Computer Science	6COM0244	O(All)			X							X	X		X		X		X	X	
	Computer Science - Year Abroad	6COM0291	O(All)			X											X		X		X	
	Computer Science - Study Abroad	6COM1058	O(All)			X											X		X		X	
	Software Architecture	6COM2013	C (AI, CN, CS, SE, CompStu)	X	X		X					X	X				X	X		X		
	Responsible Computing	6COM2010	C(All)			X											X	X		X		
	Mobile Computing	6COM1047	C(CS)	X			X				X				X					X		
	Real-time and Control Systems	6COM2009	C(CS)	X	X						X	X		X	X		X		X	X		
	Internet of Things	6COM2008	C(CS)	X			X				X						X	X	X	X		
	Computer Science Project	6COM2018	C(CS)	X	X	X	X				X	X	X	X	X		X	X	X	X	X	
	Advanced Artificial Intelligence	6COM2000	C(AI)	X	X				X		X	X	X		X		X	X	X			
	Social and collective Artificial Intelligence	6COM2012	C(AI)	X	X				X		X	X	X		X		X	X	X			
	Intelligent Adaptive Systems	6COM2007	C(AI)	X	X				X		X	X	X		X		X	X	X			
	Artificial Intelligence Project	6COM2017	C(AI)	X	X	X	X				X	X	X	X	X		X	X	X	X	X	
	Cyber Security	6COM1040	C(CN)				X			X		X										
	Incident Response Digital Forensics	6COM2006	C(CN)			X	X			X		X					X					
	Network Protocols and Architectures	6COM1039	C(CN)		X		X			X			X									
	Cyber Security and Networks Project	6COM2019	C(CN)	X	X	X	X			X		X	X	X	X		X	X	X	X	X	
	Software Engineering Techniques	6COM2014	C(SE)	X			X		X			X	X	X	X				X			
	Software Quality	6COM2015	C(SE)	X	X		X					X										
	Advanced Programming Paradigms	6COM2001	C(SE)	X			X					X										
Software Engineering Project	6COM2021	C(SE)	X	X	X	X	X	X			X	X	X	X	X		X	X	X	X		

Level	Module Title	Module Code	Compulsory (C) or Optional (O)	Knowledge and Understanding								Practical Skills						Transferable Skills				
				A1	A2	A3	A4	A5	A6	A7	A8	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5
L6	Cloud Computing	6COM2002	C(IT)	X	X	X		X				X	X		X		X	X			X	
	Computer Systems Security	6COM1033	C(IT, CompStu)	X	X	X		X				X				X	X	X				
	Data Mining and Visualisation	6COM2005	C(IT, CompStu)	X	X			X				X	X	X			X	X				
	Information Technology Project	6COM2020	C(IT)	X	X	X		X				X	X	X	X		X	X	X	X	X	
	Computer Studies Technical Report	6COM2003	C(CompStud)			X								X			X	X	X	X	X	
	Robotics	6COM2011	O(All)	X	X		X				X	X			X							
	Advanced Database Topics	6COM1048	O(All)	X				X				X			X	X	X				X	
	Machine Learning and Neural Computing	6COM1044	O(All)				X					X				X						
	Information Security Management	6COM1050	O(All)		X												X					

## KEY TO PROGRAMME LEARNING OUTCOMES

### Knowledge and Understanding

- A1. The methodology of developing programmed solutions and a subset of the tools, notations and techniques appropriate to the various stages of development, from problem identification to system implementation and evaluation.
- A2. The complexity of interactions between agents, which could be human or programmed systems, at various levels, and the implications of this for the developer of a programmed solution
- A3. The context within which a professional software designer operates and implications for professional practice including the legal, social, ethical and professional issues involved.

### Additionally for BSc Computer Science (CS) and specialist CS awards:

- A4. An in-depth understanding of principles and practices relevant to the design and development of programmed systems and their subsequent use in specific contexts

### Additionally for Information Technology (IT) award:

- A5. An in-depth understanding of principles and practices relevant to the design, development, configuration and operation of information technology systems and their subsequent use in specific contexts.

### Additionally for Computer Science (Software Engineering) award

- A6. An in-depth understanding of principles and practices relevant to the specification, design, implementation and evaluation of programmed systems.

### Additionally for Computer Science (Cyber Security and Networks) award:

- A7. An in-depth understanding of principles and practices relevant to evaluating and improving the security of systems, including threats and countermeasures. This includes in-depth understanding of principles and practices relevant to the design, implementation and evaluation of computer networks and systems operating in a networked environment

### Additionally for Computer Science (Artificial Intelligence) award:

- A8. An in-depth understanding of principles and practices relevant to the specification, design, implementation and evaluation of mechanisms enabling intelligence of various kinds in humans, robots and information processing systems

### Practical Skills

- C1. Use specific tools, techniques, notations and methods in the context of the design and development of programmed computer systems
- C2. Use computer systems and associated technology to support the development of programmed systems.
- C3. Engage in effective discussion of technical information as appropriate to the system design and development task.
- C4. Carry out design activities ranging from initial problem identification to system implementation and evaluation, and as an individual or participate as a member of a team carrying out a subset of these activities.

### Additionally for BSc Computer Science (CS) and specialist CS awards:

- C5. Design, implement and evaluate systems as characterised by Computer Science approaches, methodologies and practices.

### Additionally for BSc Information Technology (IT) awards:

- C6. Configure, evaluate the performance of, and protect from cyber security threats information technology systems.

### **Intellectual Skills**

Not applicable under QAA Benchmarking statement.  
Intellectual skills are subsumed under Knowledge and Understanding.

### **Transferable Skills**

- D1. Communicate effectively orally, in writing and visually using the conventions, vocabulary and the form and register of academic expression.
- D2. Manage their own learning including time management, the organization and retrieval of information, and the identification of personal needs for continuing professional development.
- D3. Select and use a variety of modes of discourse, including mathematical, informal and diagrammatic
- D4. Work effectively both independently and/or as part of a team
- D5. Reflect upon their work and the work of others, and explain, justify and otherwise defend their work and ideas, with reference to academic, professional issues, debates and conventions

## Section 2

### Programme management

<b>Relevant QAA subject benchmarking statements</b>	Computing
<b>Type of programme</b>	Undergraduate
<b>Date of validation/last periodic review</b>	October 20
<b>Date of production/ last revision of PS</b>	March 22
<b>Relevant to level/cohort</b>	Level 4 entering September 2023
<b>Administrative School</b>	School of Physics, Engineering & Computer Science
<b>Language of Delivery</b>	English

**Table 4 Course structure**

Course details			
Course Code	Course Description	HECOS	UCAS
CMCSITBSC	BSc (Hons) Computer Science and Information Technology	100359 100366 100372 100374 100376	G400 G491 GG46 GG47 G501