

School of Computer Science

Title of Programme: Modular BSc/MEng Honours in Computer Science and Information
Technology

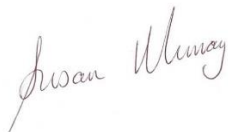
Programme Code: CMCSITBSC/CMCSITMENG

Programme Specification

This programme specification is relevant to students entering:
21 September 2020

Associate Dean of School (Academic Quality Assurance):
Susan Murray

Signature



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.

Summary of amendments to the programme:

Section	Amendment

If you have any queries regarding the changes, please email AQO@herts.ac.uk

Programme Specification Modular BSc/MEng Honours in Computer Science and Information Technology

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

Awarding Institution/Body	University of Hertfordshire
Teaching Institution	University of Hertfordshire
University/partner campuses	College Lane
Programme accredited by	N/A
Final Qualification	BSc Honours, MEng
All Final Award titles (Qualification and Subject)	BSc Honours in Computer Science BSc Honours in Computer Science (Software Engineering) BSc Honours in Computer Science (Networks) BSc Honours in Computer Science (Artificial Intelligence) BSc Honours in Information Technology MEng in Computer Science
	Note: All awards listed above are available with an optional Sandwich award, or Study Aboard or Year Abroad
FHEQ level of award	For BSc awards: Honours (H) – Level 6 For MEng awards: Masters (M) – Level 7
UCAS code(s)	G400 Computer Science G402 MEng/CS G403 Computer Science (Direct Entry) G491 Computer Science (Networks) GG46 Computer Science (Software Engineering) GG47 Computer Science (Artificial Intelligence) G501 Information Technology
Language of Delivery	English

A. Programme Rationale

The BSc/MEng 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 School of Computer Science, in particular its internationally recognised research on artificial intelligence and robotics. The programme structure and its content have been developed with input from an industry advisory group, and with reference to the benchmark statements of the British Computer Society (BCS), the Institute of Electrical and Electronics Engineers (IEEE) and 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 broad distinction between Computer Science (CS) and Information Technology (IT), and is structured so as to allow students to progress along the two main themes of computer science and information technology. 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 theme. For the computer science theme, the programme offers further specialism at level 6 providing the opportunity for students to

graduate with degree awards in three areas: software engineering, networking and cybersecurity, 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; or alternatively to undertake a period of study abroad, and so develop their understanding and skills within a different cultural environment.

Students on the computer science theme who consistently maintain the appropriate level of academic achievement at levels 4 and 5 will be eligible to join, or to continue to study on, the MEng route of the programme.

The programme therefore equips graduates for a wide variety of careers in professional roles (not necessarily constrained to the IT industry) that involve the design, development and/or the evaluation of programmed systems, or of wider socio-technical systems involving a programmed sub-system.

Further information on entry requirements is given in section F.

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 MEng awards, the programme additionally aims to provide students with opportunities to:

- develop knowledge and understanding, and practical skills in computer science at a breadth and depth beyond BSc Honours level;
- study at a level beyond undergraduate provision, and thus enhance prospects of professional and managerial employment within the context of national and international industries;
- develop the potential to be a leader in the computing profession and with industry and business; and
- study Masters-level computing related subjects underpinned by current research practices in a number of fields.

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 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 and management 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 (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.

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.

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 (2016) have been used as a guiding framework for curriculum design.

	Knowledge and Understanding of:	Teaching/learning methods & strategies	Assessment
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.	At level 4, A1 – A5 are introduced via specific topics using a combination of lectures, tutorials, practicals, online material, and guided self-study. The material is integrated via the core theme of programmed system design, and students will be helped to	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.

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 programme solution.	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.	Assessments concentrate on specific topics, within a provided framework, rather than on substantive integrative tasks.
A3	The context within which a professional software designer operates and implications for professional practice including the legal, social, ethical and professional issues involved.	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, 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 team work and project work and, through those, more substantive assessment tasks.
A4	Additionally for BSc Computer Science (CS) and specialist CS awards An in depth understanding of the theories and principles relevant to the design and development of programmed systems and their subsequent use in specific contexts.	At level 5, for both routes, additional topics addressing A1 – A5 will be introduced using lectures, tutorials, practicals, 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.	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.
A5	Additionally for Information Technology (IT) award An in depth understanding of the theories and principles relevant to the design and development of information technology systems and their subsequent use in specific contexts.	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.	At level 6, and also at level 7 for the MEng students, A1 – A9 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:
A6	Additionally for Computer Science (Software Engineering) award An in depth understanding of the theories and principles relevant to the specification, design, implementation and evaluation of programmed systems.	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	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
	Additionally for Computer Science (Networks) award	A3 will be addressed explicitly via lectures, tutorials, online material and	

A7	<p>An in depth understanding of the theories and principles relevant to the specification, design, implementation and evaluation of computer networks and systems operating in a networked environment.</p>	<p>guided self-study on specific topics.</p> <p>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.</p>	<p>solutions, referencing appropriate research or scholarship.</p> <p>At level 6, A3 may additionally be assessed through the professional placement.</p> <p>At level 7, A3 will additionally be assessed through a team-based project.</p>
A8	<p>An in depth understanding of the theories and principles relevant to the specification, design, implementation and evaluation of mechanisms enabling intelligence of various kinds in humans, robots and information processing systems.</p>	<p>At level 6, and also at level 7 for the MEng students, learning relating to A1 – A9 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</p>	
A9	<p>Additionally for Computer Science (Artificial Intelligence) award</p> <p>An in depth understanding of the theories and principles relevant to the specification, design, implementation and evaluation of mechanisms enabling intelligence of various kinds in humans, robots and information processing systems.</p> <p>Additionally for MEng Computer Science award</p> <p>A deeper and more systematic understanding of the advanced principles and theories of design, implementation and management of software.</p>		

	<p>computing and of the human and societal constraints on approaches to problem solution. Some material will be presented via lectures, tutorials, practicals and online, with significant learning undertaken and achieved through independent, self-study.</p> <p>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.</p> <p>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.</p> <p>Teaching/learning methods & strategies</p>	
Intellectual skills	Teaching/learning methods & strategies	Assessment strategy
B	Not applicable under QAA Benchmarking statement. Intellectual skills are subsumed under Knowledge and Understanding	

	Practical Skills	Teaching/learning methods & strategies	Assessment
C1	Use specific tools, techniques, notations and methods in the context of the design and development of programmed computer systems.	Level 4, 5 and 6 (and level 7 for MEng) will address C1 – C3 using lectures and tutorials for the presentation of instructional material, with practicals, 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.	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.
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.		At level 5, C3 and C4 are assessed, through a group design 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.	Level 4, 5 and 6 (and level 7 for MEng) 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, 6 (and 7 for the MEng) this support will be increasingly reduced and more open tasks will be set. Students will be exposed to employ a variety of technologies such as operating environments, programming languages, applications and specification techniques.	At level 6, for the BSc students, C1 – C6 will be assessed directly and indirectly. The independent project at level 6 will assess C4 – C6. At level 7, for the MEng students, C4 – C6 will be assessed through two projects: a team project; and an individual self-defined and managed project.
C5	Design, implement and evaluate systems as characterised by Computer Science approaches, methodologies and practices. Additionally for BSc Computer Science (CS) and specialist CS awards, and MEng Computer Science	At level 6 (and at level 7 for MEng) students will be expected to extend their skills developed in C1 – C7 to the task of evaluating and selecting appropriate approaches to addressing specific tasks appropriate to that level.	Typically, 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 C1 – C6 necessary to progress to examination for an Honours award.
C6	Design, Implement and evaluate systems as characterised by Information Technology approaches, methodologies and practices. Additionally for BSc Information Technology (IT) awards	The industrial placement period offers enhanced	

		<p>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-defined and managed project at level 6.</p> <p>For MEng students, C1 – C6 are further developed and deepened through two projects at level 7: a team project; and an individual self-defined and managed project.</p> <p>Throughout the levels of the programme, the learner is encouraged to further develop their practical skills by independent study.</p>	
	Transferable Skills	Teaching/learning methods & strategies	Assessment strategy
D1	Communicate effectively orally, in writing and visually using the conventions, vocabulary and the form and register of academic expression.	Transferable skills are developed through using a variety of teaching and learning methods and strategies.	Transferable skills are assessed through a variety of means built into the curriculum.
D2	Manage their own learning including time management, the organization and retrieval of information, and the identification of personal needs for continuing professional development.	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).	At level 4, 5 and 6 (and level 7 for MEng), 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.
D3	Select and use a variety of modes of discourse, including mathematical, informal and diagrammatic.	The development of confidence and ability to use more formal, mathematical, modes is addressed at level 4 explicitly. Central support, such as the Mathematics drop-in centre and courses	At level 4, 5 and 6 (and level 7 for MEng), 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.
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.		At level 4, 5 and 6 (and level 7 for MEng), D3 is assessed in different ways, depending on the topic and the nature of the

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.

At level 5, team-working is used explicitly in the context of a design task, and students will be supported in meeting D3 through this.

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

At level 6, and level 7 for MEng, 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 levels 6 and 7, these are supported through the self-definition of work in the project. Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal development plan.

assessment. Additionally, the independent project at level 6 (and the independent and team projects at level 7 for MEng) provide opportunities for students to select appropriate modes of discourse for the problem(s) they are seeking to address.

At level 5, D4 is assessed for group work at level 5.

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

At level 7, for MEng students, D4 is assessed through the independent project and the team project.

At levels 6 and 7, D5 is assessed by reviewing the outcomes of assignments at levels 6 and 7; and additionally through peer assessment, where appropriate e.g. level 5 team project and MEng team 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

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

The programme is offered in the following modes:

- BSc full-time (3 years)
- BSc sandwich (4 years)
- BSc year abroad (4 years)
- BSc sandwich with study abroad (4 years)
- MEng full-time (4 years)
- MEng sandwich (5 years)
- MEng year abroad (5 years)
- MEng sandwich with study abroad (5 years)

For the BSc awards, entry is normally at level 4, but entry is also possible at level 5 and at level 6 with appropriate entry qualifications. (See further information in section F)

Once a BSc student has progressed to level 5 the student has made the decision to study for the Information Technology degree or for the Computer Science degree, and the student cannot transfer between the BSc Computer Science and BSc Information Technology themes/routes.

BSc Computer Science (*not* Information Technology) students and MEng students may transfer to the alternate programme at the end of level 4 or level 5, and at the end of their placement year prior to progression to level 6.

Professional and Statutory Regulatory Bodies

The programme is accredited by the British Computer Society.

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 36 weeks of approved, supervised work experience. Students are supported by the Careers and Employment Service in finding a placement.

Year 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 typically 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

The programme structure is presented in Table 2 through Table 13, with progression information provided in Table 14. Interim awards are identified in Table 15. Final awards are identified in Table 16. The Programme Learning Outcomes are developed and assessed through the constituent modules. Table 17 identifies where

each Programme Learning Outcome is assessed in modules.

NOTE: All optional modules, at all levels of the programme, 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 2 Level 4 modules for all BSc (Hons) and MEng routes through the programme

Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Human Dimensions of Computing	4COM1035	30	English	0	100	0	B
Programming	4COM1037	30	English	40	60	0	AB
Models and Methods in Computing	4COM1040	30	English	0	100	0	A
Platforms for Computing	4COM1042	30	English	0	100	0	AB

Table 3 Level 5 modules for all BSc (Hons) Computer Science routes and for MEng Computer Science

Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Contemporary Issues	5COM1051	15	English	100	0	0	A
Database Concepts	5COM1052	15	English	50	50	0	A
CS Development Exercise	5COM1053	30	English	40	60	0	AB
Algorithms and Data Structures	5COM1054	15	English	85	15	0	A
Operating Systems and Networks	5COM1055	15	English	90	10	0	B
The C Family	5COM1059	15	English	70	30	0	B
Optional Modules Choose ONE							
Artificial Intelligence	5COM1056	15	English	50	50	0	B
Computer Architecture	5COM1057	15	English	0	100	0	B
Cognitive and Social Robotics	5COM1058	15	English	0	100	0	B

Table 4 Level 5 modules for Computer Studies students who intend to return to BSc (Hons) Computer Science routes

Notes:

- Computer Science (all routes) students who have failed 4COM1037 Programming and who intend to progress to Level 5 can progress onto the Computer Studies route
- *Compulsory module at level 4 (typically for students who do not have an FNFA status code on 4COM1037 Programming
- ** At the discretion of the Board of Examiners, the following optional modules at level 5 are available

Compulsory Modules Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Contemporary Issues	5COM1051	15	English	100	0	0	A
Database Concepts	5COM1052	15	English	50	50	0	A
CS Development Exercise	5COM1053	30	English	40	60	0	AB
Algorithms and Data Structures	5COM1054	15	English	85	15	0	A
Operating Systems and Networks	5COM1055	15	English	90	10	0	B
The C Family	5COM1059	15	English	70	30	0	B
*Programming	4COM1037	30	English	40	60	0	AB

**Optional Modules, choose ONE Module Titles	Module Code	Credit Points	Language of Delivery	% examination	% coursework	% Practical	Semesters
Artificial Intelligence	5COM1056	15	English	50	50	0	B
Computer Architecture	5COM1057	15	English	0	100	0	B
Cognitive and Social Robotics	5COM1058	15	English	0	100	0	B

Table 5 Level 5 modules for Information Technology

Compulsory Modules Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Contemporary Issues	5COM1051	15	English	100	0	0	A
System Requirements	5COM1062	15	English	0	100	0	A
Enterprise Databases	5COM1064	15	English	50	50	0	A
IT in Organisations	5COM1060	15	English	0	100	0	B
Operating Systems and Networks	5COM1055	15	English	90	10	0	B
Web Scripting	5COM1063	15	English	0	100	0	B
IT Development Exercise	5COM1061	30	English	40	60	0	AB

Table 6 Level 5 modules for Computer Studies students who intend to return to BSc (Hons) Information Technology route

Notes:

- Information Technology students who have failed 4COM1037 Programming and who intend to progress to Level 5 can progress onto the Computer Studies route
- *Compulsory module at level 4 (typically for students who do not have an FNFA status code on 4COM1037 Programming)

Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Contemporary Issues	5COM1051	15	English	100	0	0	A
Enterprise Databases	5COM1064	15	English	50	50	0	A
System Requirements	5COM1062	15	English	0	100	0	A
IT in Organisations	5COM1060	15	English	0	100	0	B
Operating Systems and Networks	5COM1055	15	English	90	10	0	B
Web Scripting	5COM1063	15	English	0	100	0	B
IT Development Exercise	5COM1061	30	English	40	60	0	AB
* Programming	4COM1037	30	English	40	60	0	AB

Table 7 Optional Placement or Year Abroad for all BSc (Hons) and MEng routes

Module Titles	Module Code	Credit Points	Language of Delivery	% examination	% coursework	% Practical	Semesters
Professional Work Placement in Computer Science or	6COM0244	0	English	0	100	0	AB
Computer Science – Year Abroad	6COM1058	0	Varies				AB
Computer Science – Study Abroad	6COM1059	0	Varies				A or B

Note: Computer Science students progressing to level 6 studies

- all modules from Table 8(a);
- all specialist modules for chosen specialist route from Table 8(b) i.e. Computer Science, Artificial Intelligence, Networks *or* Software Engineering **and**

- choose one module in Semester A and one module in Semester B from Table 8(c)

Table 8(a) Level 6 core modules for all BSc (Hons) Computer Science routes

Compulsory Modules Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Project Planning	6COM1031	15	English	0	100	0	A
Computer Systems Security	6COM1033	15	English	0	100	0	A

Table 8(b) Level 6 core modules for specialist BSc (Hons) Computer Science routes

Compulsory Modules (Computer Science route) Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Advanced Database Topics	6COM1048	15	English	50	50	0	A
Concurrency	6COM1034	15	English	80	20	0	B
Computer Science Project	6COM1053	30	English	0	100	0	B

Compulsory Modules (Artificial Intelligence route) Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Constructive Artificial Intelligence	6COM1035	15	English	0	100	0	A
AI Robotics and Applications	6COM1036	15	English	0	100	0	B
Artificial Intelligence Project	6COM1054	30	English	0	100	0	B

Compulsory Modules (Networks route) Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Network Protocols and Architectures	6COM1067	15	English	0	100	0	A
Cyber Security	6COM1040	15	English	75	25	0	B
Networks Project	6COM1055	30	English	0	100	0	B

Compulsory Modules (Software Engineering route) Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Object Oriented Development	6COM1037	15	English	67	33	0	A
Software Engineering Practice	6COM1038	15	English	30	70	0	B
Software Engineering Project	6COM1056	30	English	0	100	0	B

Table 8(c) Level 6 optional modules for all BSc (Hons) Computer Science routes

Optional Modules (choose ONE from Semester A and ONE from Semester B.) Module Titles	Module Code	Credit Points	Language of Delivery	% examination	% coursework	% Practical	Semesters
Artificial Life	6COM1041	15	English	0	100	0	A
Mobile Computing	6COM1047	15	English	0	100	0	A
Embedded Systems Development	6COM1043	15	English	0	100	0	A
Software Quality	6COM1042	15	English	0	100	0	B
Machine Learning and Neural Computing	6COM1044	15	English	0	100	0	B
Quantum Computing	6COM1046	15	English	0	100	0	B
Programming Paradigms	6COM1045	15	English	60	40	0	B
Data Security and Biometrics	6ENT1031	15	English	60	40	0	B

Table 9 Level 6 modules for Computer Studies students who had originally intended to return to BSc (Hons) Computer Science

Notes: Computer Studies students do **NOT** take the final year project, so instead must take **TWO** additional taught modules in Semester B. Students on the Level 6 Computer Studies course instance(s) will typically have failed, with an FNFA status code on 4COM1037 Programming.

Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Project Planning	6COM1031	15	English	0	100	0	A
Strategic IT Management	6COM1049	15	English	0	100	0	A
Advanced Database Topics	6COM1048	15	English	50	50	0	A
Software Quality	6COM1042	15	English	0	100	0	B

Module Titles	Module Code	Credit Points	Language of Delivery	% examination	% coursework	% Practical	Semesters
*Optional Modules (At the discretion of the Board of Examiners, and subject to resource and timetable constraints)							
User Experience	6COM1032	15	English	0	100	0	A
Computer Systems Security	6COM1033	15	English	0	100	0	A
Artificial Life	6COM1041	15	English	0	100	0	A
Embedded Systems Development	6COM1043	15	English	0	100	0	A
Mobile Computing	6COM1047	15	English	0	100	0	A
Concurrency	6COM1034	15	English	80	20	0	B
Machine Learning and Neural Computing	6COM1044	15	English	0	100	0	B
Quantum Computing	6COM1046	15	English	0	100	0	B
Programming Paradigms	6COM1045	15	English	60	40	0	B
Information Security Management	6COM1050	15	English	0	100	0	B

Table 10 Level 6 modules for BSc (Hons) Information Technology

Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Project Planning	6COM1031	15	English	0	100	0	A
User Experience	6COM1032	15	English	0	100	0	A
Advanced Database Topics	6COM1048	15	English	50	50	0	A
Information Security Management	6COM1050	15	English	0	100	0	B
IT Project	6COM1057	30	English	0	100	0	B

Module Titles	Module Code	Credit Points	Language of Delivery	% examination	% coursework	% Practical	Semesters
Optional Modules (choose ONE from Semester A and ONE from Semester B)							
Advanced Web Scripting	6COM1051	15	English	60	0	40	A
Strategic IT Management	6COM1049	15	English	0	100	0	A
Software Quality	6COM1042	15	English	0	100	0	B
Programming Paradigms	6COM1045	15	English	60	40	0	B

Table 11 Level 6 modules for Computer Studies students who had originally intended to return to BSc (Hons) Information Technology

Notes: Computer Studies students do **NOT** take the final year project, so instead must take **TWO** additional taught modules in Semester A. Students on the Level 6 Computer Studies course instance(s) will typically have failed, with an FNFA status code on 4COM1037 Programming.

Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Project Planning	6COM1031	15	English	0	100	0	A
User Experience	6COM1032	15	English	0	100	0	A
Advanced Database Topics	6COM1048	15	English	50	50	0	A
Strategic IT Management	6COM1049	15	English	0	100	0	A
Advanced Web Scripting	6COM1051	15	English	60	0	40	A
Information Security Management	6COM1050	15	English	0	100	0	B
Software Quality	6COM1042	15	English	0	100	0	B
Programming Paradigms	6COM1045	15	English	60	40	0	B

Table 12 Level 6 modules for MEng Computer Science (Year 3)

	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Module Title							
Advanced Database Topics	6COM1048	15	English	50	50	0	A
Computer Systems Security	6COM1033	15	English	0	100	0	A
Strategic IT Management	6COM1049	15	English	0	100	0	A
MEng Project Planning	7COM1062	15	English	0	100	0	A
Concurrency	6COM1034	15	English	80	20	0	B
Programming Paradigms	6COM1045	15	English	60	40	0	B
MEng Team Project	7COM1063	30	English	0	100	0	B

Table 13 Level 7 modules for MEng Computer Science (Year 4)

	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Module Title							
Measures and Models for Software Engineering	7COM1024	30	English	67	33	0	A
Advanced Computer Science Master Project	7COM1039	60	English	0	100	0	AB

	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	% Practical	Semesters
Level 6 Optional Modules (choose TWO)							
Module Title							
AI Robotics and Applications	6COM1036	15	English	0	100	0	B
Software Engineering Practice	6COM1038	15	English	30	70	0	B
Cyber Security	6COM1040	15	English	75	25	0	B
Software Quality	6COM1042	15	English	0	100	0	B
Machine Learning and Neural Computing	6COM1044	15	English	0	100	0	B
Quantum Computing	6COM1046	15	English	0	100	0	B
Data Security and Biometrics	6ENT1031	15	English	60	40	0	B
Data mining	7COM1018	15	English	60	40	0	A

Progression

UPR AS14 contains the University regulations governing the awards of this programme. Programme-specific progression requirements are presented below in Table 14. Programme-specific minimum requirements for eligibility to interim and final awards are presented in Table 15 and Table 16.

Programme-specific progression requirements for the MEng

A BSc Computer Science student who wants to transfer onto the MEng programme must have achieved pass grades in all modules at the appropriate prior levels of the programme, and must have at least an upper second class grade profile (as defined by UPR AS14) at *each* prior level of the programme. For example, a BSc Computer Science student at the end of level 4 who wants to transfer to MEng Level 5 must have passed all of his or her level 4 modules and have a grade profile for those modules of at least an upper second class. Similarly, a BSc Computer Science student at the end of level 5 who wants to transfer to MEng Level 6 must have passed all of her or his modules at level 4 and at level 5, and have a grade profile for level 4 and also a grade profile for level 5 that are *each* equivalent to at least an upper second class.

Where a level 4 or level 5 MEng student does not maintain the upper second class grade profile the Board of Examiners has the authority to transfer the student onto the BSc(Hons) Computer Science route or the BSc non-Honours Computer Science route.

Where a level 6 MEng student does not maintain the upper second class grade profile, and is therefore not eligible to progress into the final year (level 7) of the MEng, the Board of Examiners has the authority to award the MEng student a BSc(Hons) Computer Science degree or an ordinary BSc Computer Science degree.

An MEng student who wishes to leave the programme at the end of level 6, or during their studies at level 7, will be eligible for the interim award of BSc(Hons) Computer Science degree or a BSc Computer Science degree, provided the student has achieved the requirements of the respective award.

Table 14 Progression on the programme

From the following course instance	To the following course instance	Minimum requirements
Progression from Level 4 to Level 5		
CMS1S, IFT1S	CMS2S, IFT2S	90 credits or more at Level 4 including a pass in 4COM1037 Programming. Students progress to CMS2S for Computer Science and to IFT2S for Information Technology. Maximum study rate permissible is 135 credits per year for students with 90 credits at Level 4 and the Level 4 shortfall should be redeemed at the first available opportunity
CMS1S, IFT1S, CMSMENG1S	CSTCS2S, CSTIT2S	90 credits at Level 4, with NO pass in 4COM1037 Programming. Students intending to return to the Computer Science route progress to CSTCS2S. Students intending to return to the IT route progress to CSTIT2S. Maximum study rate permissible is 120 credits per and the Level 4 shortfall should be redeemed at the first available opportunity
CMSMENG1S	CMSMENG2S	120 credits at Level 4, with a pass in 4COM1037 Programming and an average overall grade at Level 4 equivalent to the degree classification of Upper Second Class (2:1)
CMSMENG1S	CMS2S IFT2S	90 credits or more at Level 4 including a pass in 4COM1037 Programming; OR 120 credits but with an average overall grade at Level 4 equivalent to less than an Upper Second Class (<2:1). Students progress to CMS2S for Computer Science and to IFT2S for Information Technology
Progression from Level 5 to Level 6		

From the following course instance	To the following course instance	Minimum requirements
CMS2S, IFT2S	CMS3F, IFT3F	120 credit points at Level 4 and 120 credits at Level 5. OR 210 credits or more at Level 4 and Level 5, with at least 90 credits at Level 5 (including a pass in 4COM1037 Programming).
CMS2S, IFT2S	CMSNH3F, IFTNH3F	180 credits or more, but less than 210 credits. (Maximum study rate permissible is 120 credits per year and the Level 4/Level 5 shortfall should be redeemed at the first available opportunity.)
CSTCS2S, CSTIT2S	CMS3F, IFT3F	210 credits or more at Level 4 and Level 5, with at least 90 credits at Level 5; AND a pass in 4COM1037 Programming. Students are transferred back onto the CS or IT programmes.
CSTCS2S, CSTIT2S	CSTCSNH3F, CSTITNH3F	180 credits or more, but less than 210 credits. (Maximum study rate permissible is 120 credits per year and the Level 4/Level 5 shortfall should be redeemed at the first available opportunity.)
CSTCS2S, CSTIT2S	CSTCS3F, CSTIT3F	210 credits or more at Level 4 and Level 5, with at least 90 credits at Level 5; but NO pass in 4COM1037 Programming. Students remain on Computer Studies.
CMSMENG2S	CMS3F	210 credits or more at Level 4 and Level 5, with at least 90 credits at Level 5; but with an average overall grade at Level 5 equivalent to less than an Upper Second Class (<2:1). Students progress to CMS3F for Computer Science
CMSMENG2S	CMSNH3F	180 credits or more, but less than 210 credits. (Maximum study rate permissible is 120 credits per year and the Level 4/Level 5 shortfall should be redeemed at the first available opportunity.)
CMSMENG2S	CMSMENG3F	240 credits at Level 4 and Level 5, including 120 credits at Level 5 AND an average overall grade at Level 5 equivalent to the degree classification of Upper Second Class (2:1)
Progression to Placement or Year Abroad		
CMS2S	CMS3S	210 credits or more at Level 4 and Level 5, with at least 90 credits at Level 5; and successfully secured placement or Year Abroad
IFT2S	IFT3S	210 credits or more at Level 4 and Level 5, with at least 90 credits at Level 5; and successfully secured placement or Year Abroad
CMSMENG2S	CMSMENG3S	240 credits at Level 4 and Level 5, including 120 credits at Level 5 AND an average overall grade at Level 5 equivalent to the degree classification of Upper Second Class (2:1); and successfully secured placement or Year Abroad
Progression from Placement or Year Abroad		
CMS3S	CMS4S	210 credits or more at Level 4 and Level 5, with at least 90 credits at Level 5; and successfully completed placement, or successfully completed Year Abroad
IFT3S	IFT4S	210 credits or more at Level 4 and Level 5, with at least 90 credits at Level 5; and successfully completed placement, or successfully completed Year Abroad

From the following course instance	To the following course instance	Minimum requirements
CMSMENG3S	CMSMENG4S	240 credits at Level 4 and Level 5, including 120 credits at Level 5 AND an average overall grade at Level 5 equivalent to the degree classification of Upper Second Class (2:1); and successfully completed placement, or successfully completed Year Abroad
Progression from Level 6, for MEng students only		
CMSMENG3F	CMSMENG4F	360 credits at Level 4 and Level 5, including 120 credits at Level 5 AND an average overall grade at Level 5 equivalent to the degree classification of Upper Second Class (2:1).
CMSMENG4S	CMSMENG5S	360 credits at Level 4 and Level 5, including 120 credits at Level 5 AND an average overall grade at Level 5 equivalent to the degree classification of Upper Second Class (2:1); and successfully completed placement, or successfully completed Year Abroad

Honours classification for the BSc and MEng awards

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

Table 15 and 16 Final and interim awards available

The programme provides for the following interim (see Table 15) and final awards (see Table 16).

Table 15 Interim Awards

Award	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: http://sitem.herts.ac.uk/secreg/upr/AS11.htm
Certificate of Higher Education	120 credit points at level 4	4, 5	For untitled awards: See UPR AS11, section 13: http://sitem.herts.ac.uk/secreg/upr/AS11.htm
Diploma of Higher Education Computer Science	240 credit points including at least 120 at level 5	5, 6	For named awards: A1, A2, A3 and partial fulfillment of A4 C1, C2, C3 C4 and partial fulfillment of C5 D1, D2, D3, D4 and D5
Diploma of Higher Education in Information Technology	240 credit points including at least 120 at level 5	5, 6	For named awards: A1, A2, A3 and partial fulfillment of A5 C1, C2, C3 C4 and partial fulfillment of C6 D1, D2, D3, D4 and D5
BSc Computer Science or BSc Information Technology	300 credit points including 180 at level 6/5 of which 60 must be at level 6	6	For named awards: A1, A2, A3 and partial fulfillment of A4 (CS) or A5 (IT) C1, C2, C3 C4 and partial fulfillment of C5 (CS) or C6 (IT) D1, D2, D3, D4 and D5
BSc Computer Studies <i>available as an interim award for BSc students only</i>	300 credit points including 180 at level 5 or above, of which 60 must be at level 6	6	For named awards: A1, A2, A3 and partial fulfillment of A4 C1, C2, C3 C4 and partial fulfillment of C5 D1, D2, D3, D4 and D5
BSc (Hons) Computer Studies	360 credit points including 180 at level 5	6	For named awards: A1, A2, A3 and partial fulfillment of A4 C1, C2, C3 C4 and partial fulfillment of C5

	or above, of which 90 must be at level 6		D1, D2, D3, D4 and D5
BSc (Hons) Computer Science <i>is available as an interim award for MEng students only</i>	360 credit points including 240 at level 5 or above, of which 120 must be at level 6 or above	6	For named awards: A1, A2, A3, A4 and partial fulfillment of A9 C1, C2, C3 C4 and C5 D1, D2, D3, D4 and D5

Table 16 Final Awards

Award	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
BSc (Hons) is available as a final award with the following titles, all of which are available with an optional sandwich award, or Year Abroad or Study Abroad: <ul style="list-style-type: none"> • Computer Science • Computer Science (Software Engineering) • Computer Science (Networks) • Computer Science (Artificial Intelligence) • Information Technology 	360 credit points including 240 at level 5 or above, of which 120 must be at level 6; and successful completion of the award-specific final year project. Additionally: for the sandwich award: successful completion of the year in industry OR for the Year Abroad or Study Abroad awards: successful completion of the appropriate period of study abroad.	6	All programme learning outcomes (see Table 17)
MEng in Computer Science	480 credit points including 360 at level 5 or above, of which 120 must be at level 6 or above, and 120 at level 7.	7	All programme learning outcomes (see Table 17)
MEng in Computer Science (Sandwich)	480 credit points including 360 at level 5 or above, of which 120 must be at level 6 or above, and 120 at level 7. Additionally, for the sandwich award: successful completion of the year in industry.	7	All programme learning outcomes (see Table 17)

Honours classification

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

Programme-specific assessment regulations

The programme complies with the University's academic regulations (in particular, [UPR AS11](#), [UPR AS12/UPR AS13](#) and [UPR AS14](#)) with the exception of those listed below, which have been approved by the University:

Refer to Table 14 for a summary of the progression requirements of the programme.

Period of registration: 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.

Final year BSc projects: A student cannot be compensated for the final year project.

Eligibility for a specialist Honours award: To be eligible for a specialist Honours award, a student must pass, or be accredited with passes, in the compulsory modules for that award as identified in Table 8 through Table 10, as well as a pass (without compensation) in the project module for that award.

Eligibility for MEng award: In addition to achieving the prescribed number of credits for the MEng award students must pass, or be accredited with passes, in the compulsory modules for the MEng, as identified in Table 12 and Table 13. Compensated passes cannot be awarded for the level 7 MEng Team Project and for the level 7 MSc individual project.

Eligibility of a MEng student for a BSc (Hons) Computer Science award: where a MEng student chooses to exit the programme, they may be awarded a BSc (Hons) Computer Science award provided the student has passed, or been accredited with passes, for 360 credits. MEng students exiting with the award of a BSc (Hons) will not however have undertaken the level 6 individual project. Consequently, the level 7 MEng Team Project will be substituted for the level 6 individual project when the Board determines if the student has satisfied the learning outcomes, and achieved the required credits, for the award of a BSc(Hons).

E. Management of Programme & Support for student learning.

Management

The programme is managed and administered through:

- A Year Tutor/Programme Leader to help students understand the course/programme structure;
- Personal Tutors to provide academic and pastoral support;
- Student representatives on programme committees;
- A Student Forum, co-chaired by students

Support

Students are supported by:

- An period of induction and transition at the beginning of each new academic session;
- Attractive modern study environments in 2 Learning Resources Centres
- 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, incorporating Chaplaincy, Counselling and Nursery;
- StudyNet, a versatile on-line inter-active intranet and learning environment
- Guided student-centred learning through the use of StudyNet;
- Access to extensive digital and print collections of information resources
- Medical Centre;
- A Study Success hubs;
- A University-wide Disability Advisor service;
- An Equality Office;
- The Students' Union;

- A Careers and Placements Service for all current students and graduates;
- Module option talks, which provide students with the opportunity to receive information relating to modules on offer for the following academic year;
- Module delivery information given out at the commencement of each module;
- A range of computing laboratories

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;
- A Module Guide 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/>. Furthermore, the OfS has judged that the University of Hertfordshire delivers consistently outstanding teaching, learning and outcomes for its students. It is of the highest quality found in the UK. Consequently, the University received a Gold award in the 2018 Teaching Excellence and Student Outcomes (TEF) exercise. This award was made in June 2018 and is valid for up to 3 years. The TEF panel's report and conclusions can be accessed at: <https://www.officeforstudents.org.uk/advice-and-guidance/teaching/tef-outcomes/#/provider/10007147>

G. Entry requirements

The normal minimum entry requirements for the programme are:

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).

If you would like this information in an alternative format please contact:
BSc/MEng CSIT Programme Leader (cmcsit@herts.ac.uk)

If you wish to receive a copy of the latest Programme Annual Monitoring and Evaluation Report (AMER) and/or the External Examiner's Report for the programme, please email a request to aqo@herts.ac.uk

Table 17: Development of 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.

	Module Title	Module Code	elective(e) or compulsory (c)	Programme Learning Outcomes (as identified in section 1 and the following page)																				
				Knowledge & Understanding									Practical Skills						Transferable Skills					
				A1	A2	A3	A4	A5	A6	A7	A8	A9	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5	
Level 4	Human Dimensions of Computing	4COM1035	C		X	X								X					X	X		X	X	
	Programming	4COM1037	C	X	X									X			X							
	Models and Methods in Computing	4COM1041	C	X										X							X			
	Platforms for Computing	4COM1042	C	X	X																			
Level 5	Contemporary Issues	5COM1051	C			X												X	X					
	Database Concepts	5COM1052	C (CS)	X										X			X							
	CS Development Exercise	5COM1053	C (CS)	X		X	X									X	X	X	X	X	X	X	X	
	Algorithms and Data Structures	5COM1054	C (CS)	X			X							X			X	X						
	Operating Systems and Networks	5COM1055	C		X		X						X		X			X						
	Artificial Intelligence	5COM1056	E1A(CS)	X	X		X						X	X										
	Computer Architecture	5COM1057	E1A(CS)		X		X								X									
	Cognitive and Social Robotics	5COM1058	E1B(CS)	X	X		X							X										
	The C Family	5COM1059	C(CS)	X			X							X										
	IT in Organisations	5COM1060	C(IT)			X		X									X		X					
	IT Development Exercise	5COM1061	C(IT)	X		X		X								X	X		X	X	X	X	X	
	System Requirements	5COM1062	C(IT)	X	X			X						X			X		X					
	Web Scripting	5COM1063	C(IT)	X	X			X						X			X		X					
	Enterprise Databases	5COM1064	C(IT)	X	X			X						X			X		X					

			Programme Learning Outcomes (as identified in section 1 and the following page)																						
		elective(e) or compulsory (c)	Knowledge & Understanding									Practical Skills						Transferable Skills							
Module Title	Module Code		A1	A2	A3	A4	A5	A6	A7	A8	A9	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5			
Professional Work Placement in Computer Science	6COM0244	E (All)			X									X		X	X		X		X	X			
Computer Science - Year Abroad	6COM0291	E (All)			X													X		X	X				
Computer Science - Study Abroad	6COM1058	E (All)			X													X		X	X				
Project Planning	6COM1031	C	X		X							X					X	X			X				
User Experience	6COM1032	C (IT)	X	X			X				X			X	X	X									
Computer Systems Security	6COM1033	C(CS)	X	X	X							X													
Concurrency	6COM1034	C(CS)		X		X					X														
Constructive Artificial Intelligence	6COM1035	C(AI)	X	X		X				X	X				X										
AI Robotics and Applications	6COM1036	C(AI)	X	X		X			X	X					X										
Object Oriented Development	6COM1037	C(SE)	X			X		X			X			X	X										
Software Engineering Practice	6COM1038	C(SE)	X			X		X			X	X	X	X	X				X						
Network Protocols and Architectures	6COM1039	C(NS)		X		X			X			X													
Cyber Security	6COM1040	C(NS)				X		X			X														
Artificial Life	6COM1041	E1A(CS)	X	X		X					X			X											
Software Quality	6COM1042	E1B(ALL)	X	X		X					X														
Embedded Systems Development	6COM1043	E1A(CS)	X			X						X													
Machine Learning and Neural Computing	6COM1044	E1B(CS)				X					X				X										
Programming Paradigms	6COM1045	E1A(CS)	X			X					X														
Quantum Computing	6COM1046	E1B(CS)				X					X				X										
Mobile Computing	6COM1047	E1B(CS)	X			X					X				X										
Advanced Database Topics	6COM1048	C(CS&IT)	X				X				X			X	X	X									

Level 6

	Strategic IT Management	6COM1049	E1A(IT)		X	X		X							X	X	X					
	Information Security Management	6COM1050	C(IT)		X												X					
	Advanced Web Scripting	6COM1051	E1A(IT)	X	X						X				X	X	X					
	Data Security and Biometrics	6ENT1031	E1B(CS)	X	X							X										
	Computer Science Project	6COM1053	C(CS)		X		X					X		X	X	X		X	X	X	X	X
	Artificial Intelligence Project	6COM1054	C(AI)		X					X		X		X	X	X		X	X	X	X	X
	Networks Project	6COM1055	C(NS)						X			X		X	X	X		X	X	X	X	X
	Software Engineering Project	6COM1056	C(SE)					X				X		X	X	X		X	X	X	X	X
	Information Technology Project	6COM1057	C(IT)		X			X					X		X	X	X		X	X	X	X
Level 7	MEng Project Planning	7COM1062	C(MEng)	X		X					X	X						X	X	X	X	X
	MEng Team Project	7COM1063	C(MEng)	X	X	X					X	X		X	X	X		X	X	X	X	X
	Advanced CS Masters Project	7COM1039	C(MEng)		X						X	X		X	X	X		X	X	X	X	X
	Measures and Models for Software Engineering	7COM1024	E(MEng)				X				X		X	X	X	X						
	Theory and Practice of Artificial Intelligence	7COM1034	E(MEng)								X											
	Distributed Systems Security	7COM1027	E(MEng)		X							X										
	Artificial Life with Robotics	7COM1032	E(MEng)	X	X							X	X	X								
Data Mining	7COM1018	E(MEng)		X							X	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 programme 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 the theories and principles 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 the theories and principles relevant to the design and development of information technology systems and their subsequent use in specific contexts.
Additionally for Computer Science (Software Engineering) award
- A6. An in depth understanding of the theories and principles relevant to the specification, design, implementation and evaluation of programmed systems.
Additionally for Computer Science (Networks) award
- A7. An in depth understanding of the theories and principles relevant to the specification, 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 the theories and principles relevant to the specification, design, implementation and evaluation of mechanisms enabling intelligence of various kinds in humans, robots and information processing systems.
Additionally for MEng Computer Science award
- A9. A deeper and more systematic understanding of the advanced principles and theories of design, implementation and management of software.

Intellectual Skills

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

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, and MEng Computer Science
- C5 Design, implement and evaluate systems as characterised by Computer Science approaches, methodologies and practices.
Additionally for BSc Information Technology (IT) awards
- C6 Design, Implement and evaluate systems as characterised by Information Technology approaches, methodologies and practices. [For BSc IT degree titles]

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

Relevant QAA subject benchmarking statements

Type of programme

Date of validation/last periodic review

Date of production/ last revision of PS

Relevant to level/cohort

Administrative School

Computing

Undergraduate

February 16

April 2020

Choose a level entering September 2020

School of Computer Science

Table 3 Course structure

Course details		
Course code	Course description	HECOS
CMCSITBSC	BSc (Hons) Computer Science and Information Technology	100359 (8%) 100366 (12%) 100372 (12%) 100374 (50%) 100376 (18%)

Course details		
Course code	Course description	HECOS
CMCSITMENG	MEng (Hons) Computer Science	100359 (8%) 100366 (12%) 100372 (12%) 100374 (50%) 100376 (18%)