Programme Specification
Undergraduate

Applicable to all non-clinical undergraduate programmes*

Please click here for guidance on completing this specification template.

***Excluding Integrated Master's degrees.**

Part A: Programme Summary Information

1.	**Title of programme:**	BSc Computer Science	
2.	**Programme Code:**	G400/G40A	
3.	**Entry Award:**	**Credit:**	**Level:**
☐	BA (Hons)		
☒	BSc (Hons)	360	At least 90 credits at level 6 Year 1: the majority of credit at level 4 Year 2: the majority of credit at level 5
☐	Other (please specify below):		
4.	**Exit Awards:**	**Credit:**	**Level:**
☒	Diploma in Higher Education (Dip HE)	240	Year 1: the majority of credit at level 4 Year 2: the majority of credit at level 5
☒	Certificate in Higher Education (Cert HE)	120	The majority of credit at level 4
5.	**Date of first intake:**	Pre 1990	
6.	**Frequency of intake:**	Annually in September/October	
7.	**Duration and mode of study:**	Full time, 3 years	
8.	**Applicable framework:**	Model for Non-Clinical First Degree Programmes	
	Framework exemption required: Please indicate the applicable boxes:	☐ No (please go to section 9) ☒ Yes (please provide a brief summary below)	

		COMP221 (Planning Your Career) is a Pass/Fail module excluded from the degree classification algorithm.
	Date exemption approved:	To be considered by AQSC.
9.	**Applicable Ordinance:**	General Ordinance for Undergraduate Degrees and Diploma/Certificate in Higher Education
	New/revised Ordinance required: Please indicate the applicable boxes:	☒ No (please go to section 10) ☐ Yes (please provide a brief summary below)
	Date new/revised Ordinance approved by Council:	
10.	**Faculty:**	Faculty of Science and Engineering
11:	**Level 2 School/Institute:**	School of Electrical Engineering, Electronics and Computer Science
12.	**Level 1 unit:**	Department of Computer Science
13.	**Campus:**	Liverpool campus
14.	**Other contributors from UoL:**	Department of Electrical Engineering & Electronics
15:	**Teaching other than at UoL:**	None
16:	**Director of Studies:**	Dr David Jackson
17:	**Board of Studies:**	Board of Studies in Computer Science
18:	**Board of Examiners:**	The Computer Science Undergraduate Boards of Examiners
19.	**External Examiner(s):** Name Institution Position	Professor Richard Jones, University of Kent (Subject Level); Professor Francesca Toni, Imperial College, London (Subject Level)
20.	**Professional, Statutory or Regulatory body:**	BCS, The Chartered Institute for IT
21:	**QAA Subject benchmark Statements(s):**	Computing (Feb 2016)
22.	**Other reference points:**	BCS Course Guidelines and Course Accreditation Criteria

23.	**Fees:**	Standard undergraduate fees
24.	**Additional costs to the student:**	During the course of students would be expected to spend approximately £37.29 on printing. Students would not be required to purchase text books for any recommended or essential reading as they can be obtained from the University library. If students wish to purchase their own text books for some modules the cost is approximately between £45-£50 per book. A calculator might be required costing up to £15 new.
25:	**University Approval Panel approval:**	First approved by AQSC pre-1990

Part B: Programme Aims & Objectives

26. Aims of the Programme

The aim of the Computer Science programme is to provide students with a good "all-round" understanding of the field of Computer Science, while at the same time allowing student to specialise in particular areas such as algorithmics, artificial intelligence, data sciences, software development, etc.

No.	**Aim:**

27.	**Learning Outcomes**
No.	**Learning outcomes – Bachelor's Honour's degree**
1	**Cognitive Abilities**
1.1	Systematic and detailed knowledge and understanding of the essential facts, concepts, principles and theories relating to Computer Science.
1.2	A detailed knowledge of how 1.1 can be used to model and design computer-based systems.
1.3	The capability to recognise and critically analyse criteria and specifications appropriate to problems to be solved by computer, and plan innovative strategies for their solution.
1.4	A systematic knowledge of the criteria and mechanisms whereby computer-based systems can be critically evaluated and analysed to determine the extent to which they meet the criteria defined for their current and future development.
1.5	A detailed understanding of the appropriate theory, practices, languages and tools that may be deployed for the specification, design, implementation and evaluation of computer-based systems.
1.6	The ability to give succinct presentations (orally, electronically or in writing) deploying rational and reasoned arguments that address a computational problem.
1.7	A systematic understanding of the professional, moral and ethical issues involved in the exploitation of computer technology, and the associated professional, ethical and legal practices.
1.8	An in-depth understanding of the field of theoretical Computer Science in the context of Computer Science.
2	**Practical Abilities**
2.1	Specify, design and construct computer-based systems in a manner that is both

	innovative and creative.
2.2	Critically evaluate and analyse computer-based systems in terms of general quality attributes, possible trade-offs presented within a given problem, risks or safety aspects that may be involved in their operation, and professional, ethical and legal issues.
2.3	Deploy effectively the tools used for the construction and documentation of computer-based systems, with practical emphasis on understanding the whole process involved in the effective deployment of computers to solve practical problems.
2.4	Operate computing equipment effectively and efficiently, taking into account a systematic understanding of its logical and physical properties.

	Learning Outcomes
No.	**Learning outcomes – Bachelor's Non-Honour's degree**
	By completing Year 3 of the programme, students will have attained the large majority of the outcomes of the Bachelor's Honours degree programme but will not have attained some outcomes at an appropriate level either as a consequence of passing insufficient module credit or by failing to demonstrate achievement of all learning outcomes specific to the individual project module. Students will have developed an understanding of Computer Science, some of it at the current boundaries of the discipline. Through this, the student will have developed analytical techniques and problem-solving skills that can be applied in many types of discipline related and generic employment. The student will be able to evaluate evidence, arguments and assumptions, to reach sound judgements and to communicate them effectively. Students will have the qualities needed for employment in situations requiring the exercise of personal responsibility, and decision making in complex and unpredictable circumstances. Students will be expected to achieve the majority of the learning outcomes outlined in Section 27. Students attaining the level of understanding qualifying for the award of a Bachelor's non-honours degree but insufficient to meet the requirements specified for the award of Bachelor's degree with Honours will not (normally) be able to specify a distinct specialist pathway (as defined in Secn. 34) and will qualify for the award of "Bachelor's Non-honours degree in Computer Science" rather than "Bachelor's Non-honours degree in Computer Science with <specialism>".

	Learning Outcomes
No.	**Learning outcomes – Diploma in Higher Education award**
1	**Cognitive Abilities**
1.9	Knowledge and critical understanding of the essential facts, concepts, principles and theories relating to Computer Science.
1.10	A good knowledge of how 1.9 can be used to model and design computer-based systems.
1.11	A good understanding of how to recognise and critically analyse criteria and specifications appropriate to problems to be solved by computer, and plan innovative strategies for their solution.
1.12	A sound knowledge of the criteria and mechanisms whereby computer-based systems can be critically evaluated and analysed to determine the extent to which they meet the criteria defined for their current and future development.
1.13	An appreciation of the appropriate theory, practices, languages and tools that may be deployed for the specification, design, implementation and evaluation of computer-based systems.
1.14	The ability to give succinct presentations (orally, electronically or in writing) deploying arguments that address a computational problem.

1.15	A good understanding of the professional, moral and ethical issues involved in the exploitation of computer technology, and the associated professional, ethical and legal practices.
1.16	A good understanding of the field of theoretical Computer Science in the context of Computer Science.
2	**Practical Abilities**
2.5	Specify, design and construct computer-based systems.
2.6	Evaluate and analyse computer-based systems in terms of general quality attributes, possible trade-offs presented within a given problem, risks or safety aspects that may be involved in their operation, and professional, ethical and legal issues.
2.7	An appreciation of the tools used for the construction and documentation of computer-based systems, with practical emphasis on understanding the whole process involved in the effective deployment of computers to solve practical problems.
2.8	Work as a member of a development team, recognising the different roles within a team and different ways of organising teams.
2.9	Operate computing equipment effectively, taking into account an understanding of its logical and physical properties.

	Learning Outcomes
No.	**Learning outcomes – Certificate in Higher Education award**
1	**Cognitive Abilities**
1.17	Knowledge and basic understanding of the essential facts, concepts, principles and theories relating to Computer Science.
1.18	A basic knowledge of how 1.17 can be used to model and design computer-based systems.
1.19	A basic understanding of how to recognise and critically analyse criteria and specifications appropriate to problems to be solved by computer, and plan innovative strategies for their solution.
1.20	A basic knowledge of the criteria and mechanisms whereby computer-based systems can be critically evaluated and analysed to determine the extent to which they meet the criteria defined for their current and future development.
1.21	A basic understanding of the appropriate theory, practices, languages and tools that may be deployed for the specification, design, implementation and evaluation of computer-based systems.
1.22	A basic knowledge of how to give succinct presentations (orally, electronically or in writing).
1.23	A basic understanding of the professional, moral and ethical issues involved in the exploitation of computer technology, and the associated professional, ethical and legal practices.
1.24	A basic understanding of the field of Theoretical Computer Science in the context of Computer Science.
2	**Practical Abilities**
2.10	A basic understanding of how to specify, design and construct simple computer-based systems.
2.11	A basic ability to evaluate computer-based systems in terms of general quality attributes, possible trade-offs presented within a given problem, risks or safety aspects that may be involved in their operation, and professional, ethical and legal issues.
2.12	A basic understanding of the tools used for the construction and documentation of computer-based systems, with practical emphasis on understanding the processes involved in the deployment of computers to solve practical problems.

2.13	An ability to operate computing equipment, taking into account a basic understanding of its logical and physical properties.
2.14	Ability to participate in a development team, with an awareness of the different roles within a team and different ways of organising teams.

27a. Mapping of learning outcomes:

Learning outcome No.	Module(s) in which this will be delivered	Mode of assessing achievement of learning outcome	PSRB/Subject benchmark statement (if applicable)
1.1 1.2 1.3	COMP304, COMP305 COMP309, COMP318, COMP323, COMP324, COMP326, COMP327, COMP331 COMP310, COMP313, COMP315, COMP319 COMP329 COMP390	Class tests/Written examinations Practical assessments/ Written examinations Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
1.4	COMP305 COMP309, COMP318, COMP327 COMP310, COMP313, COMP315, COMP319 COMP329 COMP390	Class tests/Written examination Practical assessments/ Written examinations Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
1.5	COMP305 COMP309, COMP327 COMP310, COMP313, COMP315, COMP319 COMP329, COMP335 COMP390	Class tests/Written examination Practical assessments/ Written examinations Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
1.6	COMP323, COMP327 COMP329, COMP335 COMP390	Practical assessments/ Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
1.7	COMP315	Written examination	

	COMP390 COMP335	Practical assessments/ Demonstration/Presentation/ Dissertation Practical assessments	
1.8	COMP309, COMP323, COMP326, COMP331 COMP390	Practical assessments/ Written examinations Practical assessments/ Demonstration/Presentation/ Dissertation	
1.9	COMP201, COMP207, COMP222, COMP326 COMP202, COMP218, COMP219 COMP211, COMP212, COMP220 COMP208 COMP281, COMP282, COMP283, COMP284 COMP285	Practical assessments/ Written examinations Class tests/Written examinations Practical assessments/Class tests/Written Examinations Practical assessments/ Group reports/ Presentation/ Demonstration Practical assessments	
1.10	COMP201, COMP207, COMP222 COMP202, COMP218, COMP219 COMP211, COMP212, COMP220 COMP208 COMP281, COMP282, COMP283, COMP284 COMP285	Practical assessments/ Written examinations Class tests/Written examinations Practical assessments/Class test/Written examinations Practical assessments/ Group reports/ Presentation/ Demonstration Practical assessments	
1.11	COMP201, COMP207, COMP222 COMP202, COMP218, COMP219 COMP208 COMP220 COMP281, COMP282, COMP283, COMP284, COMP285	Practical assessments/ Written examinations Class tests/Written examinations Practical assessments/ Group reports/ Presentation/ Demonstration Practical assessments/Class tests/Written examinations Practical assessments	
1.12	COMP201, COMP207, COMP222	Practical assessments/Written examinations	

	COMP202, COMP218, COMP219 COMP208 COMP211, COMP212, COMP220 COMP281, COMP282, COMP283, COMP284, COMP285	Class tests/Written examinations Practical assessments/ Group reports/ Presentation/ Demonstration Practical assessments/Class tests/Written Examinations Practical assessments	
1.13	COMP201, COMP207, COMP222 COMP202, COMP218, COMP219 COMP211, COMP212, COMP220 COMP208 COMP281, COMP282, COMP283, COMP284, COMP285	Practical assessments/ Written examinations Class tests/Written examinations Practical assessments/Class tests/Written examinations Practical assessments/ Group reports/ Presentation/ Demonstration Practical assessments	
1.14	COMP201 COMP208	Practical assessments/ Written examinations Practical assessments/ Group reports/ Presentation/ Demonstration	
	COMP211, COMP212	Practical assessments/Class tests/Written examinations	
1.15	COMP207 COMP208	Practical assessments/ Written examination Practical assessments/ Group reports/ Presentation/ Demonstration	
1.16	COMP202, COMP218 COMP208 COMP221	Class tests/Written examinations Practical assessments/ Group reports/ Presentation/ Demonstration Practical assessments	
1.17	COMP101, COMP105, COMP122 COMP111, COMP124 COMP108 COMP109, COMP116	Practical assessments Practical assessments/ Written examinations Practical assessments/Class tests/Written examination Class tests/Tutorial contributions/Written examination	

	COMP107	Practical assessments/ Essays/Presentation	
1.18	COMP101, COMP105, COMP122 COMP124 COMP107 COMP108 COMP221	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation Practical assessments/Class tests/Written examination Practical assessments	
1.19	COMP101, COMP105, COMP122 COMP124 COMP107 COMP108	Practical assessments Practical assessments/Written examinations Practical assessments/ Essays/Presentation Practical assessments/Class tests/Written examination	
1.20	COMP101, COMP105, COMP122 COMP124 COMP107 COMP108	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation Practical assessments/Class tests/Written examination	
1.21	COMP101, COMP105, COMP122 COMP111, COMP124 COMP107 COMP108 COMP109, COMP116	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation Practical assessments/Class tests/Written examination Class tests/Tutorial contributions/Written examination	
1.22	COMP101, COMP105, COMP122 COMP124 COMP107	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation	
1.23	COMP107	Practical assessments/ Essays/Presentation	
1.24	COMP108, COMP111	Practical assessments/Class test/Written examination	

	COMP109, COMP116	Class tests/Tutorial contributions/Written examination	
2.1	COMP304, COMP305 COMP309, COMP323, COMP324 COMP327 COMP329 COMP390	Class tests/Written examinations Practical assessments/ Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
2.2	COMP304, COMP305 COMP309, COMP323, COMP324, COMP326, COMP327, COMP331 COMP329 COMP390	Class tests/Written examinations Practical assessments/ Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
2.3	COMP304, COMP305 COMP323, COMP324, COMP326, COMP327, COMP331 COMP329 COMP390	Class tests/Written examinations Practical assessments/ Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
2.4	COMP305 COMP309, COMP323, COMP324, COMP327 COMP329 COMP390	Class tests/Written examinations Practical assessments/ Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
2.5	COMP105, COMP122, COMP221 COMP201, COMP207 COMP111, COMP202, COMP218, COMP219 COMP208 COMP281, COMP282, COMP283, COMP284, COMP285	Practical assessments Practical assessments/ Written examinations Class tests/Written examinations Practical assessments/ Group reports/ Presentation/ Demonstration Practical assessments	
2.6	COMP122 COMP201, COMP207	Practical assessments Practical assessments/ Written examinations	

	COMP111, COMP202, COMP218, COMP219 COMP208 COMP221, COMP281, COMP282, COMP283, COMP284, COMP285	Class tests/Written examinations Practical assessments/ Group reports/ Presentation/ Demonstration Practical assessments	
2.7	COMP122 COMP201, COMP207 COMP208 COMP219, COMP111 COMP221, COMP281, COMP282, COMP283, COMP284, COMP285	Practical assessments Practical assessments/ Written examinations Practical assessments/ Group reports/ Presentation/ Demonstration Class tests/Written examinations Practical assessments	
2.8	COMP208 COMP221	Practical assessments/ Group reports/Presentation/ Demonstration Practical assessments	
2.9	COMP122 COMP201, COMP207 COMP111, COMP202, COMP218, COMP219 COMP208 COMP221, COMP281, COMP282, COMP283, COMP284, COMP285	Practical assessments Practical assessments/ Written examinations Class tests/Written examinations Practical assessments/ Group reports/Presentation/ Demonstration Practical assessments	
2.10	COMP101, COMP105, COMP122 COMP124 COMP107 COMP108 COMP109	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation Practical assessments/Class tests/Written examination Class tests/Written examination	
2.11	COMP101, COMP105, COMP122 COMP124 COMP108	Practical assessments Practical assessments/ Written examinations Practical assessments/ Class tests/Written examination	

	COMP107	Practical assessments/ Essays/Presentation	
2.12	COMP101, COMP105, COMP122 COMP108, COMP124 COMP107 COMP116	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation Class tests/Tutorial contributions/Written examination	
2.13	COMP101, COMP105, COMP122 COMP124 COMP108 COMP107	Practical assessments Practical assessments/ Written examinations Practical assessments/Class tests/Written examination Practical assessments/ Essays/Presentation	
2.14	COMP107	Practical assessments/ Group reports/Presentation/ Demonstration	

28.	**Skills and Other Attributes**
No.	**Skills and attributes:**
1	Effective information retrieval skills (including use of the WWW and the evaluation of information retrieved from such sources).
2	A good foundation in basic numeracy.
3	The ability to use general IT facilities effectively.
4	The ability to manage their own learning and development, and time management and organisational skills.
5	An appreciation of the need for continuing professional development in recognition for the need for lifelong learning.
6	An appreciation of Computer Science practice as emerging and developing discipline.

28a. Mapping of skills and other attributes:

Skills and other attributes No.	**Module(s) in which this will be delivered and assessed**	**Learning skills, research skills, employability skills**	**Mode of assessing achievement of the skill or other attribute**
1	COMP101, COMP105, COMP122, COMP221, COMP281, COMP282, COMP283, COMP284, COMP285, COMP329 COMP124 COMP201, COMP207, COMP323, COMP324, COMP327 COMP107 COMP202, COMP305	Learning skills	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation Class tests/Written examinations

	COMP208 COMP390		Practical assessments/Group reports/ Presentation/Demonstration Practical assessments/ Demonstration/ Presentation/Dissertation
2	COMP207, COMP309, COMP327 COMP108 COMP109, COMP116 COMP202, COMP111, COMP218, COMP219, COMP305 COMP310, COMP315 COMP107, COMP221, COMP329	Employability skills	Practical assessments/ Written examinations Practical assessments/Class tests/Written examination Class tests/Tutorial contribution/Written examination Class tests/Written examinations Written examinations Practical assessments
3	COMP101, COMP105, COMP107, COMP122, COMP281, COMP282, COMP283, COMP284, COMP285, COMP329 COMP124, COMP201, COMP207, COMP323, COMP324, COMP327 COMP208 COMP305, COMP111 COMP390	Employability skills	Practical assessments Practical assessments/ Written Practical assessments/ Group reports/Presentation/ Demonstration Class tests/Written examination Practical assessments/ Demonstration/Presentation/ Dissertation
	COMP101, COMP105, COMP122, COMP281, COMP282, COMP283, COMP284, COMP285, COMP329		Practical assessments
4	COMP124, COMP201, COMP207, COMP309 COMP323, COMP324, COMP326, COMP327, COMP331 COMP108 COMP109, COMP116 COMP107 COMP109, COMP116, COMP202, COMP218, COMP219, COMP111, COMP304, COMP305	Employability skills	Practical assessments/ Written examinations Practical assessments/Class tests/Written examination Class Tests/Tutorial contributions/Written examination Practical assessments/ Essays/Presentation Class tests/Written examinations

	COMP208 COMP310, COMP313, COMP315, COMP319 COMP390		Practical assessments/ Group reports/Presentation/ Demonstration Written examinations Practical assessments/ Demonstration/Presentation/ Dissertation
	COMP101, COMP105, COMP122, COMP221, COMP329		Practical assessments
5	COMP107 COMP221 COMP201, COMP207, COMP327 COMP208 COMP313, COMP315 COMP390 COMP207, COMP309, COMP323, COMP324, COMP326, COMP327, COMP331	Employability skills	Practical assessments/ Essays/Presentation Practical assessments Practical assessments/ Written examinations Practical assessments/ Group reports/Presentation/ Demonstration Written examinations Practical assessments/ Demonstration/Presentation/ Dissertation Practical assessments/ Written examinations
6	COMP208 COMP304, COMP305 COMP310, COMP313, COMP315, COMP319 COMP329 COMP390 COMP390	Research skills	Practical assessments/ Group reports/Presentation/ Demonstration Class tests/Written examinations Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation Practical assessments/ Demonstration/Presentation/ Dissertation

29. Career opportunities:

The programme is directed at all career opportunities within the general domain of Computer Science.

Part C: Entrance Requirements

30. Academic Requirements:

The typical offer for entrance to degree programmes in the Department of Computer Science is three subjects at GCE A level with grades ABB or better, including A level in Computer Science or a mathematical subject (Mathematics,

Further Mathematics, Pure Mathematics, Computing/Computer Science, and Physics). All students are also expected to have GCSE English Language at grade C or better.

A wide range of other UK and International qualifications are also accepted.

Overseas qualifications are considered using NARIC to verify O/S qualifications and standards. Candidates from non-English speaking countries are expected to have IELTS >= 6.0 with minimum 5.5 in each component (other English Language Tests are also accepted, see https://www.liverpool.ac.uk/study/international/apply/english-language/ for details).

31. Work experience:

It is University Policy to encourage mature entry. Each case is considered on merit, but in such cases work experience is taken into account.

32. Other requirements:

None

Part D: Programme Structure

33. Programme Structure:

In 2016/17, the cohort of students admitted in September 2016 will complete the following (please see the final 2016/17 G400/G40A Programme Specification for the mapping of skills and Learning Outcomes):

YEAR 1						
Module Code	***Module Title***	***Credit Value***	***Level***	***Co-requisite***	***Pre-requisites***	***Pre-requisite for****
Semester 1						
COMP101	*Introduction to Programming in Java (•)*	*15*	***4***	-	-	*COMP102 COMP103 COMP104 COMP106 COMP201 COMP207 COMP208 COMP213 COMP219*
COMP103	*Computer Systems (•)*	*15*	*4*	*COMP101*	-	*Number of second year modules*
COMP109	*Foundations of Computer Science (•)*	*15*	*4*	*COMP101 COMP103*	-	*COMP108 COMP118 COMP202 COMP218*
Semester 1 and 2						
COMP110	*Professional Skills in Computer Science (+)*	*7.5*	*4*	-	-	-
COMP102	*Introduction to Databases (•)*	*15*	*4*	*COMP101*	-	*COMP207 COMP208*
Semester 2						

COMP104	*Operating System Concepts (•)*	*15*	*4*	*-*	*COMP101 COMP103*	*-*
COMP106	*Human-Centric Computing (•)*	*15*	*4*	*-*	*COMP101*	*-*
COMP108	*Algorithmic Foundations (•)*	*15*	*4*	*-*	*COMP109*	*COMP218 COMP202*
COMP118	*Logic in Computer Science (•)*	*7.5*	*4*	*-*	*COMP109*	*COMP219 COMP304 COMP313*

YEAR 2						
Module Code	***Module Title***	***Credit Value***	***Level***	***Co-requisite***	***Pre-requisite***	***Pre-requisite for****
Semester 1						
COMP201	*Software Engineering I (•)*	*15*	*5*	*-*	*COMP101 COMP102*	*COMP208*
COMP207	*Database Development (•)*	*15*	*5*	*-*	*COMP101 COMP102*	*-*
COMP213	*Advanced Object Oriented Programming (•)*	*15*	*5*	*-*	*COMP101*	*-*
COMP219	*Artificial Intelligence (•)*	*15*	*5*	*-*	*COMP101; COMP118 or equivalent*	*COMP304*
Semester 2						
COMP202	*Complexity of Algorithms (•)*	*15*	*5*	*-*	*COMP108*	*Number of third year options*
COMP218	*Decision, Computation and Language (•)*	*15*	*5*	*-*	*COMP108 COMP109*	*-*
COMP208	*Group Software Project (•)*	*15*	*5*	*-*	*COMP101, COMP102, COMP104, COMP106, COMP108, COMP110 or equivalents; COMP201; COMP207; COMP213*	*Final Year Project*
Plus options totalling 15 credits from the following five modules provided pre-requisites are satisfied						
COMP281	*Principles of C and Memory Management*	*7.5*	*5*	*-*	*COMP213*	*COMP282 COMP327*
COMP282	*Advanced Object Oriented C Languages*	*7.5*	*5*	*-*	*COMP281*	*COMP327*

COMP283	*Applied Database Management*	*7.5*	*5*	-	*COMP102 COMP207*	-
COMP284	*Scripting Languages*	*7.5*	*5*	-	*COMP101 COMP102*	-
COMP285	*Computer Aided Software Development*	*7.5*	*5*	-	*COMP101 COMP201*	-

YEAR 3						
Module Code	***Module Title***	***Credit Value***	***Level***	***Co-requisite***	***Pre-requisites***	***Pre-requisite for***
Semester 1 and 2						
COMP390	*Honours Year Computer Science Project (+)*	*30*	*6*	-	*COMP101, COMP102, COMP104, COMP110 or equivalents; COMP106 and COMP108 recommended*	-
Semester 1						
COMP309	*Efficient Sequential Algorithms (•)*	*15*	*6*	-	*COMP202*	-
Plus options totalling 30 credits from the following modules provided pre-requisites are satisfied						
COMP304	*Knowledge Representation and Reasoning*	*15*	*6*	-	*COMP219*	-
COMP305	*Biocomputation*	*15*	*6*	-	-	-
COMP319	*Software Engineering II*	*15*	*6*	-	*COMP201*	-
COMP323	*Introduction to Computational Game Theory*	*15*	*6*	-	*COMP109 or equivalent mathematical module*	*COMP326*
COMP327	*Mobile Computing*	*15*	*6*	-	*COMP106 COMP281 COMP282*	-
COMP329	*Robotics and Autonomous Systems*	*15*	*6*	-	-	-
COMP331	*Optimisation*	*15*	*6*	-	-	-
Semester 2						
Plus options totalling 45 credits from the following modules provided pre-requisites are satisfied						
COMP310	*Multi-Agent Systems*	*15*	*6*	-	-	-
COMP313	*Formal Methods*	*15*	*6*	-	*COMP118 or equivalent; COMP201*	-
COMP315	*Technologies for E-Commerce*	*15*	*6*	-	*COMP207*	-

COMP324	*Complex Social Networks*	*15*	*6*	*-*	*-*	*-*
COMP326	*Computational Game Theory and Mechanism Design*	*15*	*6*	*-*	*COMP109 COMP323*	*-*
Semester 1 and 2						
***COMP335*	*Communicating Computer Science*	*15*	*6*	*-*	*-*	*-*

Students admitted from September 2017 (effective 2017/18) will complete the following:

Students are expected to pursue the following BSc programme structure:

- Computer Science

or

select one of the following three options, *Computer Science with*:

- Artificial Intelligence (CAI).
- Algorithms and Optimisation (CAO).
- Data Sciences (CDS).

In Year 1 students will study one of the modules COMP101 (Intro. to Programming) or COMP105 (Programming Language Paradigms). The option deemed most suitable will be determined, typically (although not exclusively) through indications of reasonable prior exposure to programming. For example, students who have obtained a recognised entry qualification in a computing related subject (eg Computer Science A-level) will study COMP105. Students without such background will normally study COMP101, however, may (at the discretion of Programme Director of Studies) be permitted to enrol on COMP105 instead. All other Year 1 modules are required and the same for all programmes.

COMP221 can be taken as an option in Semester 1 Year 2 in conjunction with 60 credits taken from other modules, totalling 67.5 credits in Semester 1, followed by 52.5 credits taken in Semester 2. If COMP221 is not taken, 60 credits are to be taken in Semester 1 and 60 credits are to be taken in Semester 2.

COMP221 is a 7.5 credit pass/fail module, which is taken out of the degree classification calculations.

For the **Artificial Intelligence** specialism pathway students should choose COMP219 and get at least 15 credits from COMP218 and COMP222 options in Year 2 and at least 60 credits from COMP304, COMP305, COMP310, COMP313, COMP318 and COMP329 options in Year 3.

For the **Algorithms and Optimisation** specialism pathway students should get at least 30 credits from COMP218, COMP220, COMP226, COMP 284 and COMP285 options in Year 2 and at least 60 credits from COMP305, COMP309, COMP323, COMP324, COMP326 and COMP331 options in Year 3.

For the **Data Sciences** specialism pathway students should take COMP219, COMP281 and COMP284 in Year 2 and get at least 60 credits from COMP310, COMP313, COMP318, COMP329, COMP331, ELEC319 and ELEC320.

For **Computer Science** (no specialism pathway) there are no requirements on the selection of optional modules.

The programme of study is split into years and semesters as follows.
(•) *indicates a required module and* (+) *indicates a mandatory module*

YEAR 1						
Module Code	**Module Title**	**Credit Value**	**Level**	**Co-requisite**	**Pre-requisites**	**Pre-requisite for***
Semester 1						
COMP101 **or** COMP105	Introduction to Programming (•) Programming Language Paradigms (•)	15 15	4 4	- -	- A-level Computer Science expected	COMP122 COMP122
COMP107	Graduates for the Digital Society (•)	15	4	-	-	COMP201, COMP207, COMP208, COMP221, COMP283, COMP284, COMP390
COMP109	Foundations of Computer Science (•)	15	4	-	-	COMP218, COMP304, COMP313
COMP111	Introduction to Artificial Intelligence (•)	15	4	-	-	COMP219, COMP222, COMP304, COMP310, COMP329
Semester 2						
COMP108	Data Structures and Algorithms (•)	15	4		-	COMP202, COMP208, COMP218
COMP116	Analytical Techniques in Computer Science (•)	15	4	-	-	COMP202, COMP219, COMP226, COMP305, COMP323, COMP326, COMP331
COMP122	Object-Oriented Programming (•)	15	4	-	COMP101 or COMP105	COMP201, COMP207, COMP220, COMP211, COMP212, COMP222, COMP281, COMP284, COMP285, COMP208, COMP327, COMP390
COMP124	Computer Systems (•)	15	4	-	-	COMP208, COMP211, COMP212, COMP327, COMP329

**May also be a pre-requisite for modules on other programmes*

YEAR 2						
Module	**Module Title**	**Credit**	**Level**	**Co-**	**Pre-requisite**	**Pre-**

Code		Value		requisite		requisite for*
Semester 1						
COMP201	Software Engineering I (•)	15	5	-	COMP122, COMP107	COMP208, COMP220, COMP285, COMP319, COMP313
COMP207	Database Development (•)	15	5	-	COMP122, COMP107	COMP208, COMP283, COMP284, COMP315
Plus options totalling 30 to 37.5 credits[1] from the following modules provided pre-requisites are satisfied*						
COMP105*[2]	Programming Language Paradigms	15	4	-	-	-
COMP211	Internet Principles	15	5	-	COMP122, COMP124	COMP212, COMP318
COMP219	Artificial Intelligence	15	5	-	COMP116, COMP111 or equivalent	COMP305, COMP313, COMP318, COMP329
COMP221	Planning Your Career	7.5	5	-	COMP107	-
Semester 2						
COMP202	Complexity of Algorithms (•)	15	5	-	COMP108, COMP116	COMP309, COMP324
COMP208	Group Software Project (•)	15	5	-	COMP108, COMP107, COMP124, COMP122, or equivalents; COMP201; COMP207;or equivalent	COMP390
Plus options totalling 22.5 to 30 credits[1] from the following modules provided pre-requisites are satisfied*						
COMP212	Distributed Systems	15	5	-	COMP122, COMP124, COMP211	COMP318
COMP218	Decision, Computation and Language	15	5	-	COMP108 COMP109	-
COMP220*[3]	Software Development Tools	15	5	-	COMP122; COMP201;	-
COMP222	Principles of Computer Game Design and Implementation	15	5	-	COMP122, COMP111	-
COMP226	Computer-Based Trading in Financial Markets	15	5	-	COMP116	-
COMP281	Principles of C and Memory Management	7.5	5	-	COMP122	COMP282 COMP327

COMP282	Advanced Object Oriented C Languages	7.5	5	-	COMP281	COMP327
COMP283	Applied Database Management	7.5	5	-	COMP107 COMP207	-
COMP284	Scripting Languages	7.5	5	-	COMP122 COMP107 COMP207	-
COMP285*[3]	Computer Aided Software Development	7.5	5	-	COMP122 COMP201	-

**May also be a pre-requisite for modules on other programmes*
[1]120 credits to be taken in Year 2***
**[2]COMP105 cannot be taken again, if already taken in Year 1*
**[3]COMP220 and COMP285 cannot be taken in conjunction.*

YEAR 3						
Module Code	**Module Title**	**Credit Value**	**Level**	**Co-requisite**	**Pre-requisites**	**Pre-requisite for**
Semester 1 and 2						
COMP390	Honours Year Computer Science Project (+)	30	6	-	COMP122, COMP107 or equivalents, COMP208 and COMP108 recommended	-
Semester 1						
Plus options totalling 45 credits from the following modules provided pre-requisites are satisfied[1]						
COMP304	Knowledge Representation and Reasoning	15	6	-	COMP109, COMP111	-
COMP305	Biocomputation	15	6	-	COMP116, COMP219	-
COMP309	Efficient Sequential Algorithms	15	6	-	COMP202	-
COMP319	Software Engineering II	15	6	-	COMP201	-
COMP323	Introduction to Computational Game Theory	15	6	-	COMP116 or equivalent mathematical module	COMP326
COMP327	Mobile Computing	15	6	-	COMP122, COMP124, COMP281, COMP282	-
COMP329	Robotics and Autonomous Systems	15	6	-	COMP111, COMP124, COMP219	-
COMP331	Optimisation	15	6	-	COMP116	-
ELEC319	Image Processing	7.5	6	-	-	-

Semester 2						
Plus options totalling 45 credits from the following modules provided pre-requisites are satisfied[1]						
COMP310	Multi-Agent Systems	15	6	-	COMP111	-
COMP313	Formal Methods	15	6	-	COMP109, COMP201, COMP219	-
COMP315	Technologies for E-Commerce	15	6	-	COMP207	-
COMP318	Advanced Web Technologies	15	6	-	COMP211, COMP212, COMP219	-
COMP324	Complex Social Networks	15	6	-	COMP202	-
COMP326	Computational Game Theory and Mechanism Design	15	6	-	COMP116, COMP323	-
ELEC320	Neural Networks	7.5	6	-	-	-
Semester 1 and 2						
COMP335***	Communicating Computer Science	15	6	-	-	-

****Students who wish to choose this module will undergo an interview with the Module Co-ordinator before being selected.*
[1]If ELEC319, ELEC320 or COMP335 are taken, an imbalance of 15 credits between the two semesters is allowed.* ***120 credits to be taken in Year 3.*

Note:

1. In exceptional circumstances, and with the approval of the programme Director of Studies, alternative modules may be substituted for non-mandatory modules.
2. Students may undertake their second year of studies at Xian-Jiaotong Liverpool University (XJTLU), Suzhou, China. See Section 34 for details.

34. Industrial placement/work placement/year abroad:

Year abroad:

Students may undertake their second year of studies at Xian-Jiaotong Liverpool University (XJTLU), Suzhou, China, with permission of the UoL/XJTLU link tutor at the Department of Computer Science, University of Liverpool, in consultation with the Study Abroad Team and the Director of Studies for this programme, taking into consideration the academic performance of students in their first year of studies. Students are required to take the following modules during their time at XJTLU and are required to take the assessments associated with these modules at XJTLU, including re-sit assessments if necessary.

YEAR 2				
Module Code	**Module Title**	**Credit Value**	**Level**	**Semester**
CSE201	Database Development and Design (•)	15	5	1
CSE203	Decision, Computation and Language (•)	15	5	1
CSE205	Internet Principles (•)	15	5	1

CSE207	Software Engineering I (•)	15	5	1
CSE202	Artificial Intelligence (•)	15	5	2
CSE204	Complexity of Algorithms (•)	15	5	2
CSE208	Software Engineering Group Project (•)	15	5	2
CSE210	Advanced Object Oriented Programming (•)	15	5	2

Credits and marks gained at XJTLU will count (without moderation) towards the student's Liverpool degree.

During their time at XJTLU, students will be advised by the UoL/XJTLU link tutor at the Department of Computer Science and Software Engineering, XJTLU. They also remain in contact with their academic advisor at the University of Liverpool.

Industrial placements/Work placements

N/A

35. Liaison between the Level 2 Schools/Institutes involved:

N/A

Part E: Learning, Teaching And Assessment Strategies

36. Learning, Teaching and Assessment Strategies:

The programme complies with:

a. University of Liverpool's Education Strategy 2026 and Strategic Action Plan (https://www.liverpool.ac.uk/aqsd/learning-and-teaching/education-strategy/)
b. University of Liverpool Code of Practice on Assessment (all at https://www.liverpool.ac.uk/aqsd/academic-codes-of-practice/code-of-practice-on-assessment/)
c. Department of Computer Science Learning and Teaching Strategy: http://www.csc.liv.ac.uk/department/ltas/LTAS.html

The Department has made use of techniques associated with e-learning for many years. In this programme (as in all others), lecture material, additional reading material, assignments, model solutions and feedback are all made available online. In addition, some modules have experimented with online provision of video-recorded lectures, electronic discussion forums and teaching software. Continually assessed work is often submitted electronically, allowing plagiarism detection to be performed automatically, and reports on such work may be returned in a similar fashion. A computer-based system is also used for all attendance monitoring at lectures and tutorials.

36a. Learning, Teaching and Assessment methods:

The programme is delivered through a mixture of formal lectures, practical and tutorial sessions, guided reading, student centred learning, and project work. The programme operates under the approved teaching and learning strategy of the Department of Computer Science.

The programme is assessed by a combination of traditional written examinations and continuous assessment, including marked essays and computer programming problems. Practical assessment is employed for both formative assessment and summative assessment. In more detail, modules in the Computer Science programme are assessed as follows (according to the nature of the module):

i. Examination only where the assessment is based entirely on examination, which is held at the end of the semester in which the module is taught.
ii. Continuous Assessment.
iii. Examination and continuous assessment.

At Level 4, all modules provide a degree of formative assessment via tutorial and lab sessions as well as in-class tests and problem solving exercises. For all Levels, most summative assessment is individual work, with team-based work comprising a key component of assessment at Level 5. Formative feedback is given on completion of student coursework. The second year group project and the Honours year project include elements of assessment by oral, poster and demonstration representation of project work. The mark produced for a module is subject to scrutiny by the Computer Science Undergraduate Boards of Examiners including the External Examiner for this programme. Decisions on progress are also controlled by the university's published regulations.

The Department currently does not conduct any "viva voce" examinations.

Details of the assessment method for each module can be obtained from the Department of Computer Science Student Handbook. For information on adjustments to examination arrangements for disabled students see Appendix K of the University Code of Practice on Assessment.

37. Assessment information for students:

Code of Practice on Assessment

The University has a Code of Practice on Assessment which brings together the main institutional policies and rules on assessment. The Code is an authoritative statement of the philosophy and principles underlying all assessment activities and of the University's expectations in relation to how academic subjects design, implement and review assessment strategies for all taught programmes of study.

The Code of Practice includes a number of Appendices which provide more detail on the regulations and rules that govern assessment activity; these include:

- The University marks scale, marking descriptors and qualification descriptors;
- The model for non-clinical first degree programmes;
- The system for classifying three-year, non-clinical, undergraduate degrees;
- The system for classifying four-year, non-clinical, undergraduate degrees that include a year in industry or a year abroad;
- Information about students' progress, including guidance for students;
- The procedure for assessment appeals;
- Regulations for the conduct of exams;
- The University's policy on making adjustments to exam arrangements for disabled students.
- The code of practice relating to external examining (see also below)
- The Academic Integrity Policy, which covers matters such as plagiarism and

collusion and includes guidance for students;
- The policy relating to mitigating circumstances which explains what you should do if you have mitigating circumstances that have affected assessment; and
- The policy on providing students with feedback on assessment.

Please click here to access the Code of Practice on Assessment and its appendices; this link will also give you access to assessment information that is specific to your cohort:

A summary of key assessment information is also available in the 'Your University' handbook.

Marking criteria:
Marking on level 4, 5 and 6 modules offered by the Department of Computer Science is carried out using the following marking descriptors:

	For practical exercises and projects	**For exercises, presentations, projects, and written examinations:**
90-100% **Exceptional performance**	Displays an *exceptional* degree of originality and creativity and/or *exceptional* analytical and problem solving skills. Solution must have novel aspects. The methodology employed is well-developed and correct.	Shows *critical* understanding of current knowledge. For level 6 this should include relevant recent research papers. Perceptive, focused treatment of all issues/questions presented in a critical and scholarly way.
80-89% **Outstanding**	Displays a level of originality and creativity and/or the ability to suggest realistic solutions to novel problems. The methodology employed is well-developed and correct.	Evidence of wide reading. For level 6 this should include relevant research papers and books. Perceptive, focused treatment of all issues/questions presented in a critical and scholarly way.
70-79% **Excellent**	Demonstrates ability to analyse, interpret and organise information to produce coherent accounts or solve complex problems. All aspects of a suitable methodology evident and used correctly.	Comprehensive knowledge and understanding of the subject together with the ability to put the work into context and to critically evaluate selected aspects of the work. Arguments/answers will be clear, competently structured, and accurate.
60-69% **Very good**	Demonstrates ability to analyse, interpret and organise information to produce coherent accounts or solve relatively complex problems. Use of a suitable methodology evident and used	Good knowledge and understanding of the subject, with no major gaps or omissions, but minor gaps or omissions may occur. Arguments/answers will be clear, competently structured, and largely accurate.

	correctly, with minor omissions.	
50-59% **Good**	Displays ability to analyse, interpret and organise information to produce coherent accounts or solve well-defined problems of some scope. Most aspects of a suitable methodology evident and used correctly, some omissions occur but without negative impact on the result of the work.	Satisfactory knowledge and understanding of the essentials of the subject, with an ability to integrate information into a clear, well-structured account, but lacking in breadth or depth, or with some significant aspects omitted. Arguments/answers must be clear, although they may not be well-developed or reflect a wider appreciation of the subject. Some errors and omissions are likely to be present.
40-49% **Satisfactory**	Demonstrates an ability to solve limited, well-defined problems of a familiar type. Most aspects of a suitable methodology evident, but minor flaws in its use or omissions with some negative impact on the result of the work. Satisfactory understanding and meeting all learning outcomes.	General knowledge and understanding of the subject but very limited in depth or breadth. Arguments/answers are likely to be somewhat lacking in structure. There are likely to be errors and omissions and the evidence provided to support arguments will be very limited. Satisfactory understanding and meeting all learning outcomes.
35-39% **Compensatable Fail**	Fails to demonstrate an ability to solve limited, well-defined, problems of a familiar type. Aspects of a suitable methodology evident, but flaws in its use or omissions which negatively impact on the result of the work. Minimally sufficient understanding of all learning outcomes.	Knowledge and understanding of the subject are fragmentary, some aspects showing a very basic level of understanding but other aspects displaying fundamental errors. Arguments/answers are lacking in structure. There are errors and omissions and the evidence provided to support arguments is very limited. Minimally sufficient understanding of all learning outcomes.
30-34% **Fail**	Fails to demonstrate an ability to solve simple, well-defined problems of a familiar type. Lack of the use of a suitable methodology or flaws in its use which negatively impact on the result of the work. Understanding of at	Knowledge and understanding of the subject are fragmentary, with an insufficient number of aspects showing a very basic level of understanding and too many aspects displaying fundamental errors and omissions. Arguments/answers are

	least one associated learning outcome insufficient.	lacking in structure. There are errors and omissions and the evidence provided to support arguments is very limited. Understanding of at least one associated learning outcome insufficient.
20-29% **Fail**	Fails to demonstrate an ability to solve simple, well-defined, problems of a familiar type under guidance. Serious lack of the use of a suitable methodology or flaws in its use which negatively impact on the result of the work. Minimal grasp of task-related learning outcome(s) and a resulting failure to demonstrate understanding.	Very limited range of knowledge with many important gaps and omissions. Shows incomplete understanding with numerous errors of interpretation. Arguments/ answers have little structure, contain serious errors, and there is no support for arguments. Minimal grasp of task-related learning outcome(s) and a resulting failure to demonstrate understanding.
10-19% **Fail**	Little evidence of the use of a suitable methodology. Demonstrable and significant gaps in achieving task aims and the associated learning outcome(s)	Shows only the most limited and fragmentary knowledge of the subject with little or no understanding of essential principles and concepts. Work is likely to be unstructured and ill-presented. Arguments/ answers are only loosely related to issues/questions or only cover a seriously inadequate part of the issues/questions. Demonstrable and significant gaps in achieving task aims and the associated learning outcome(s)
0-9% **Fail**	No evidence of the use of a suitable methodology. Little or no understanding of task aims; clear failure to adequately demonstrate attainment of any associated learning outcome.	Virtually devoid of any evidence of knowledge or understanding of the subject. No or almost no arguments/answers. Little or no understanding of task aims; clear failure to adequately demonstrate attainment of any associated learning outcome.

38. Student representation and feedback:

Student representation and feedback are facilitated through:

1. The University Academic Advisor scheme.

2. The Department's Undergraduate Staff-Student Liaison Committee (which operates in accordance with the University's code of practice on student representation).
3. Module questionnaires completed by students at the end of each taught module.

Full details can be found in the Department of Computer Science Student Handbook.

Part F: Status Of Professional, Statutory Or Regulatory Body Accreditation

39. Status of Professional, Statutory or Regulatory Body Accreditation:

The programme is accredited to 2019 by BCS, the Chartered Institute for IT for the purposes of fully meeting the academic requirement for registration as Chartered IT Professional and partially meeting the academic requirement for a Chartered Engineer and as Chartered Scientist.

The programme has also been awarded the Euro-Inf Bachelor Quality Label by BCS, The Chartered Institute for IT, for intakes 2015-2019.

Part G: Diversity & Equality Of Opportunity And Widening Participation

40. Diversity & Equality of Opportunity and Widening Participation:

The programme design, structure and content are consistent and compliant with the University's Diversity and Equality of Opportunity Policy.

Annex 1

Annex of Modifications Made to the Programme

Please complete the table below to record modifications made to the programme.

Description of modification (please include details of any student consultation undertaken or confirm that students' consent was obtained where this was required)	**Minor or major modifications**	**Date approved by FAQSC**	**Date approved by AQSC (if applicable)**	**Cohort affected**
Apr 2011: Changes to programme structure for 2011-12: • Addition of modules: COMP104 (required/optional), COMP118 (required), COMP280 (optional), COMP281 (optional), COMP282 (optional),	Minor			

COMP282 (optional), COMP283 (optional), COMP284 (optional), COMP285 (optional), COMP324 (optional), COMP329 (optional). • Removal of modules: COMP114, COMP204 (replaced by COMP104). The Computer Science Staff-Student Liaison Committee was presented with draft versions of the new programme structures for all undergraduate programmes and a number of issues relating to the introduction of new modules in years 1 to 3 and the withdrawal of some year 1 modules have been discussed. • The intended changes to the curriculum were also presented to our Industrial Liaison Committee at a meeting in January 2011. The proposals, in particular, the introduction of 'Technical Skills' modules (COMP280-285) were positively received.				
Nov 2011: Amendment to entry requirements	Minor			
2014/15: Withdrawal of COMP280 as optional module	Minor			
2015/16: Addition of COMP326 and COMP331 as optional modules.	Minor			
2016/17: ADD: COMP335 (Optional) DROP: COMP317 (required)	Minor			
2017/18: 1. COMP102, COMP106, COMP110 and COMP118 will be discontinued. Practical aspects of COMP102 will be taught as part of COMP107, theoretical content will be deferred to				

Year 2. Practical aspects of COMP106 will be covered by in COMP122. Employability and professional skills will be taught as part of COMP107. Some of the COMP118 content will be absorbed into COMP109 and COMP111. 2. COMP101 becomes Introduction to Programming. The module will be aimed at introducing main programming and software engineering concepts to students without prior programming experience. This module will not be available to students with an A-level in Computer Science and students might be allowed to opt out and take COMP105 instead if they show evidence of programming experience. 3. COMP122 Object-oriented programming will be compulsory for all students and cover advanced Java programming. 4. The purpose of COMP109 becomes broader to include some topics from COMP103 (representation of numbers, bit operations, digital circuits, base 2 logarithms, exponentiation, arithmetic operations on numbers in exponential form). 5. COMP111 is a				

somewhat lightened version of COMP219 with some more advanced topics moved to the Advanced AI module in Y2. 6. Analytical techniques for Computer Science is the 2nd maths module to include continuous mathematics, probability, etc. 7. COMP124 Computer Systems will combine COMP103 and COMP104. This is made possible by absorbing some of the material into COMP101, COMP109 and COMP111. 8. Removal of COMP213 and COMP321.				