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:**	Software Development	
2.	**Programme Code:**	G610	
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):	N/A	
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:**	September 2002	
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	☒ No (please go to section 9)	

	required: Please indicate the applicable boxes:	☐ Yes (please provide a brief summary below)
	Date exemption approved by AQSC:	
9.	**Applicable Ordinance:**	Ordinance 37 General Ordinance for Undergraduate Degrees Ordinance 39 Diploma in Higher Education Ordinance 40 Certificate in Higher Education (http://www.liv.ac.uk/commsec/calendar/programme_ordinances.htm)
	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:**	None
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	Mr Alan Sexton, Lecturer, University of Birmingham (Programme Level); Professor Alessio Lomuscio, Imperial College, London (Award Level)
20.	**Professional, Statutory or Regulatory body:**	BCS, The Chartered Institute for IT

21:	**QAA Subject benchmark Statements(s):**	Computing
22.	**Other reference points:**	BCS Course Guidelines and Course Accreditation criteria
23.	**Fees:**	Standard Science
24.	**Additional costs to the student:**	None
25:	**AQSC approval:**	First approved Summer 2002

Part B: Programme Aims & Objectives

26. Aims of the Programme

Information Technology continues to spread rapidly throughout most areas of society. Within this the development, updating and widespread application of complex software is the most time-consuming, difficult and expensive aspect. It is widely acknowledged that developing efficient, robust and correct software is inherently complex, and thus there is a requirement for professional software developers. This degree programme seeks to address this requirement.

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 in general, and software development in particular.
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	An in-depth 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 Software Development and related sub-

	fields.
2	**Practical Abilities**
2.1	Specify, design and construct computer-based systems in a manner that is both innovative and creative; following sound software development principles and using a range of concepts, theories and practices.
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 software development and documentation of computer applications, with practical emphasis on understanding the whole process involved in the effective deployment of computers to solve practical problems.
2.4	Work as a member of a development team, recognising the different roles within a team and different ways of organising teams.
2.5	Operate computing equipment effectively and efficiently, taking into account a systematic understanding of its logical and physical properties.
No.	**Learning Outcomes** **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 Software Development, 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.
No.	**Learning Outcomes** **Learning outcomes – Diploma in Higher Education award**
1	**Cognitive Abilities**
1.9	Knowledge and understanding of the essential facts, concepts, principles and theories relating to computer science in general, and software development in particular.
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 Software Development and related sub-fields.
2	**Practical Abilities**
2.6	Specify, design and construct computer-based systems, using sound software development principles.
2.7	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.
2.8	An appreciation of the tools used for software development and documentation of computer applications, with practical emphasis on understanding the whole process involved in the effective deployment of computers to solve practical problems.
2.9	Ability to participate in a development team, with a good awareness of the different roles within a team and different ways of organising teams.
2.10	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	A basic knowledge and understanding of the essential facts, concepts, principles and theories relating to computer science in general, and software development in particular.
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 awareness 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	An understanding of the field of Software Development and related sub-fields.
2	**Practical Abilities**
2.11	A basic understanding of how to specify, design and construct simple computer-based systems.

2.12	A basic awareness of how 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.
2.13	A basic understanding of the tools used for software development and documentation of computer applications, with practical emphasis on understanding the whole process involved in the deployment of computers to solve practical problems.
2.15	An ability to operate computing equipment, taking into account a basic understanding of its logical and physical properties.

27a.	**Mapping of subject-based 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	COMP310, COMP313 COMP319 COMP317, COMP318 COMP323, COMP327 COMP321 COMP329 COMP390	Written examinations Practical assessments/ Written examinations Class tests/Written examination Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
1.2	COMP310, COMP313 COMP319 COMP317, COMP318 COMP323, COMP327 COMP321 COMP329 COMP390	Written examinations Practical assessments/ Written examination Class tests/Written examination Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
1.3	COMP305 COMP310, COMP313 COMP319 COMP318, COMP327 COMP329	Class tests/Written examination Written examinations Practical assessments/ Written examinations Practical assessments	

	COMP390	Practical assessments/ Demonstration/Presentation/ Dissertation	
1.4	COMP310, COMP313 COMP319 COMP317, COMP327 COMP329 COMP390	Written examinations Practical assessments/ Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
1.5	COMP310, COMP313 COMP319 COMP317, COMP327 COMP329 COMP390	Written examinations Practical assessments/ Written examinations Practical assessments Practical assessments Demonstration/Presentation/ Dissertation	
1.6	COMP323, COMP327 COMP329 COMP390	Practical assessments/ Written examinations Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
1.7	COMP390	Practical assessments/ Demonstration/Presentation/ Dissertation	
1.8	COMP313, COMP319 COMP317, COMP318 COMP390	Written examinations Practical assessments/ Written examinations Practical assessments/ Demonstration/Presentation/ Dissertation	
1.9	COMP201, COMP207 COMP213, COMP222 COMP208 COMP211, COMP212 COMP220	Practical assessments/ Written examinations Practical assessments/Group reports/Presentation/ Demonstration Practical assessments/Class test/Written examinations	

	COMP219 COMP281, COMP282 COMP283, COMP284	Class tests/Written examinations Practical assessments	
1.10	COMP201, COMP207 COMP213, COMP222 COMP208 COMP211, COMP212 COMP220 COMP219 COMP281, COMP282 COMP283, COMP284	Practical assessments/ Written examination Practical assessments/ Group reports/Presentation/ Demonstration Practical assessments/Class test/Written examinations Class tests/Written examinations Practical assessments	
1.11	COMP201, COMP207 COMP222 COMP208 COMP219 COMP220 COMP281, COMP282 COMP283, COMP284	Practical assessments/ Written examinations Practical assessments/ Group reports/Presentation/ Demonstration Class tests/Written examination Practical assessment/Class test/Written examination Practical assessments	
1.12	COMP201, COMP207 COMP213, COMP222 COMP208 COMP211, COMP212 COMP220 COMP219 COMP281, COMP282 COMP283, COMP284	Practical assessments/ Written examinations Practical assessments/ Group reports/Presentation/ Demonstration Practical assessments/Class tests/Written examinations Class tests/Written examination Practical assessments	

1.13	COMP201, COMP207 COMP213, COMP222 COMP208 COMP211, COMP212 COMP220 COMP219 COMP281, COMP282 COMP283, COMP284	Practical assessments/ Written examinations Practical assessments/Group reports/Presentation/ Demonstration Practical assessments/Class tests/Written examinations Class tests/ Written examination Practical assessments	
1.14	COMP208 COMP211, COMP212	Practical assessments/ Group reports/Presentation/ Demonstration Practical assessments/Class test/Written examinations	
1.15	COMP207 COMP208	Practical assessments/ Written examinations Practical assessments/ Group reports/Presentation/ Demonstration	
1.16	COMP201, COMP213 COMP222 COMP208 COMP281, COMP282 COMP283, COMP284	Practical assessments/ Written examinations Practical assessments/ Group reports/Presentation/ Demonstration Practical assessments	
1.17	COMP101 COMP102, COMP103 COMP104, COMP106 COMP108 COMP109 COMP110	Practical assessments Practical assessments/ Written examinations Practical assessments/Class test/Written examination Class tests/Tutorial contributions/Written examination Practical assessments/ Essays/Presentation	

	COMP118	Class tests/Written examination	
1.18	COMP101 COMP102, COMP103 COMP104, COMP106 COMP108	Practical assessments Practical assessments/ Written examination Practical assessments/Class test/Written examination	
1.19	COMP101 COMP104, COMP106 COMP108	Practical assessments Practical assessments/ Written examinations Practical assessment/Class test/Written examination	
1.20	COMP101 COMP102, COMP104 COMP106 COMP108	Practical assessments Practical assessments/ Written examinations Practical assessments/Class tests/Written examination	
1.21	COMP101 COMP102, COMP104 COMP106 COMP108 COMP109	Practical assessments Practical assessments/ Written examinations Practical assessments/Class tests/Written examination Class tests/Tutorial contributions/Written examination	
1.22	COMP101 COMP102, COMP103 COMP106 COMP110	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation	
1.23	COMP102	Practical assessments/ Written examinations	

	COMP110	Practical assessments/ Essays/Presentation	
1.24	COMP101 COMP102, COMP103 COMP104, COMP106	Practical assessments Practical assessments/ Written examinations	
2.1	COMP317, COMP318 COMP323, COMP327 COMP321 COMP329 COMP390	Practical assessments/ Written examinations Class tests/Written examination Practical assessments Practical assessments/ Demonstration/ Presentation/Dissertation	
2.2	COMP317, COMP323 COMP327 COMP321 COMP329 COMP390	Practical assessments/ Written examinations Class tests/Written examination Practical assessments Practical assessments/ Demonstration/Presentation/ Dissertation	
2.3	COMP317, COMP323 COMP327 COMP321 COMP329 COMP390	Practical assessments/ Written examinations Class tests/Written examination Practical assessments Practical assessments/ Demonstration/ Presentation/Dissertation	
2.4	COMP329	Practical assessments	
2.5	COMP317, COMP323 COMP327 COMP321 COMP329	Practical assessments/ Written examinations Class tests/Written examinations Practical assessments	

	COMP390	Practical assessments/ Demonstration/Presentation/ Dissertation	
2.6	COMP201, COMP207 COMP213, COMP222 COMP208 COMP211, COMP212 COMP220 COMP219 COMP281, COMP282 COMP283, COMP284	Practical assessments/ Written examinations Practical assessments/Group reports/Presentation/ Demonstration Practical assessments/Class test/Written examinations Class tests/Written examination Practical assessments	
2.7	COMP201, COMP207 COMP213, COMP222 COMP208 COMP211, COMP212 COMP220 COMP219, COMP321 COMP281, COMP282 COMP283, COMP284	Practical assessments/ Written examinations Practical assessments/ Group reports/Presentation/ Demonstration Practical assessments/Class test/Written examinations Class tests/Written examinations Practical assessments	
2.8	COMP201, COMP207 COMP213, COMP222 COMP208 COMP211, COMP212 COMP220 COMP219 COMP281, COMP282 COMP283, COMP284	Practical assessments/ Written examinations Practical assessments/ Group reports/Presentation/ Demonstration Practical assessments/Class test/Written examinations Class tests/Written examination Practical assessments	
2.9	COMP208	Practical assessments/ Group reports/Presentation/ Demonstration	

2.10	COMP207, COMP213 COMP222 COMP208 COMP211, COMP212 COMP220 COMP219 COMP281, COMP282 COMP283, COMP284	Practical assessments/ Written examinations Practical assessments/ Group reports/Presentation/ Demonstration Practical assessments/Class test/Written examinations Class tests/Written examinations Practical assessments	
2.11	COMP101 COMP102, COMP103 COMP104, COMP106 COMP108 COMP118	Practical assessments Practical assessments/ Written examinations Practical assessments/Class test/Written examination Class tests/Written examination	
2.12	COMP101 COMP102, COMP103 COMP104, COMP106 COMP108 COMP110	Practical assessments Practical assessments/ Written examinations Practical assessments/Class test/Written examination Practical assessments/ Essays/Presentation	
2.13	COMP101 COMP102, COMP103 COMP104, COMP106 COMP110	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation	
2.14	COMP101 COMP102, COMP103 COMP104, COMP106 COMP108	Practical assessments Practical assessments/ Written examinations Practical assessments/Class test/Written examination	

	COMP110	Practical assessments/ Essays/Presentation	

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 an 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, COMP281 COMP282, COMP283 COMP284, COMP329	Learning skills	Practical assessments
	COMP102, COMP103 COMP104, COMP106 COMP201, COMP207 COMP213, COMP222 COMP317, COMP318 COMP323, COMP327		Practical assessments/ Written examinations
	COMP110		Practical assessments/ Essays/Presentation
	COMP208		Practical assessments/ Group reports/Presentation/ Demonstration
	COMP211, COMP212 COMP220		Practical assessments/ Class tests/Written examinations
	COMP321		Class tests/Written examination
	COMP390		Practical assessments/ Demonstration/ Presentation/Dissertation

2	COMP102, COMP207 COMP317, COMP327 COMP108 COMP109 COMP118, COMP219 COMP310 COMP329	Employability skills	Practical assessments/ Written examinations Practical assessments/ Class test/Written examination Class tests/Tutorial contributions/Written examination Class tests/Written examinations Written examination Practical assessments
3	COMP101, COMP281 COMP282, COMP283 COMP284, COMP329 COMP102, COMP103 COMP104, COMP106 COMP201, COMP207 COMP213, COMP222 COMP317, COMP323 COMP327 COMP110 COMP208 COMP211, COMP212 COMP220 COMP219, COMP321 COMP390	Employability skills	Practical assessments Practical assessments/ Written examinations Practical assessments/ Essays/Presentation Practical assessments/ Group reports/ Presentation/ Demonstration Practical assessments/Class tests/Written examinations Class tests/Written examinations Practical assessments/ Demonstration/ Presentation/Dissertation
4	COMP101, COMP281 COMP282, COMP283 COMP284, COMP329	Employability skills	Practical assessments

	COMP102, COMP103 COMP104, COMP106 COMP201, COMP207 COMP317, COMP323 COMP327		Practical assessments/ Written examinations
	COMP108, COMP211 COMP212, COMP220		Class tests/Tutorial contributions/Written examinations
	COMP109		Practical assessments/Class tests/Written examination
	COMP110		Practical assessments/ Essays/Presentation
	COMP118, COMP219 COMP321		Class tests/Written examinations
	COMP208		Practical assessments/ Group reports/Presentation/ Demonstration
	COMP313, COMP319		Written examinations
	COMP390		Practical assessments/ Demonstration/ Presentation/Dissertation
5	COMP101, COMP329	Employability skills	Practical assessments
	COMP110		Practical assessments/ Essays/Presentation
	COMP201, COMP207 COMP327		Practical assessments/ Written examinations
	COMP212		Practical assessments/Class test/Written examination
	COMP208		Practical assessments/ Group reports/Presentation/ Demonstration
	COMP310, COMP313		Written examinations
	COMP390		Practical assessments/ Demonstration/ Presentation/Dissertation

6	COMP207, COMP317 COMP318, COMP323 COMP327 COMP310, COMP313 COMP319 COMP321 COMP329 COMP390	Research skills	Practical assessments/ Written examination Written examinations Class tests/Written examination Practical assessments Practical assessments/ Demonstration/ Presentation/Dissertation

29. Career opportunities:

The programme is directed at all career opportunities within the general domain of computer science and particularly those where a broad understanding of the field of Software Development would be seen as advantageous.

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 AAB or better. We give a one grade bonus (ABB) for the inclusion of one or more mathematical subjects (Mathematics, Further Mathematics, Pure Mathematics, Computing/Computer Science, and Physics) included in these three subjects. All students are also expected to have GCSE English Language at grade C or better and GCSE Mathematics 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 http://www.liv.ac.uk/study/international/countries/english-language.htm#ug 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:

Students are expected to pursue the following programme of study
(`•' indicates a required module, `+' indicates a mandatory module)

YEAR 1						
Module Code	**Module Title**	**Credit Value**	**Level**	**Co-requisites**	**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
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	
COMP118	Logic in Computer Science (•)	7.5	4	-	COMP109	COMP219 COMP313 COMP321

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

YEAR 2						
Module Code	**Module Title**	**Credit Value**	**Level**	**Co-requisites**	**Pre-requisites**	**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	-
Semester 1 and 2						
Plus either the following combination of two modules worth 30 credits:						
COMP211	Internet Principles (semester 1)	15	5	-	COMP101	-
COMP212	Distributed Systems (semester 2)	15	5	-	COMP101	-
or the following combination of two modules worth 30 credits						
COMP219	Artificial Intelligence (semester 1)	15	5	-	COMP101 COMP118	COMP222 COMP321
COMP222	Principles of Computer Game Design and Implementation (semester 2)	15	5	-	COMP219;COMP213	-
Semester 2						
COMP208	Group Software Project (•)	15	5	-	COMP101,COMP102, COMP104, COMP106, COMP108, COMP110 or equivalents; COMP201; COMP207; COMP213	Final Year Project
COMP220	Software Development Tools (•)	15	5	-	COMP101; COMP201;	-
Plus options totalling 15 credits from the following four 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	None
COMP284	Scripting Languages	7.5	5	-	COMP101 COMP102	None

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

YEAR 3						
Module Code	**Module Title**	**Credit Value**	**Level**	**Co-requisites**	**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						
COMP319	Software Engineering II (•)	15	6	-	COMP201	-
Plus options totalling 30 credits from the following seven modules provided pre-requisites are satisfied						
COMP321	Ontology Languages and their Applications	15	6	-	COMP109 and COMP118 or equivalents; or COMP219	-
COMP323	Introduction to Computational Game Theory	15	6	-	COMP109 or equivalent mathematical module	-
COMP327	Mobile Computing	15	6	-	COMP106 COMP281 COMP292	-
COMP329	Robotics and Autonomous Systems	15	6	-	None	-
Semester 2						
Plus options totalling 45 credits from the following four modules provided pre-requisites are satisfied						
COMP310	Multi-Agent Systems	15	6	-	-	-
COMP313	Formal Methods	15	6	-	COMP118 or equivalent; COMP201	-

COMP317	Semantics of Programming Languages (•)	15	6	-	-	-
COMP318	Advanced Web Technologies	15	6	-	-	-

Note: in exceptional circumstances, and with the approval of the programme Director of Studies, alternative modules may be substituted for non-mandatory modules.

34. Industrial placement/work placement/year abroad:

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 Policy on Standards and Quality in Learning and Teaching
b. University of Liverpool Learning and Study Skills Strategy
c. University of Liverpool Code of Practice on Assessment (all at http://www.liv.ac.uk/tqsd/pol_strat_cop/index.htm)
d. Department of Computer Science Learning and Teaching Strategy: http://www.csc.liv.ac.uk/department/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. 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.

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, mplement 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%	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%	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%	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%	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 correctly, with minor omissions.	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.
50-59%	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,	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

	some omissions occur but without negative impact on the result of the work.	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%	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.	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.
35-39%	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.	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.
30-34%	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.	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 lacking in structure. There are errors and omissions and the evidence provided to support arguments is very limited.
20-29%	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.	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.

10-19%	Little evidence of the use of a suitable methodology.	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.
0-9%	No evidence of the use of a suitable methodology.	Virtually devoid of any evidence of knowledge or understanding of the subject. No or almost no arguments/answers.

38. Student representation and feedback:

Student representation and feedback are facilitated through:

1. The University Academic Advisor scheme.
2. The Department's 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.
4. Programme questionnaires completed by students at the end of each year of study.

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), COMP108 (required), COMP118 (required), COMP280 (optional), COMP281 (optional), COMP282 (optional), COMP282 (optional), COMP283 (optional), COMP284 (optional), COMP324 (optional), COMP329 (optional). • Removal of modules: COMP112, 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 (COMP280-284), were	Minor			

positively received.				
Nov 2011: Amendment to entry requirements	**Minor**			
2014-15: Withdrawal of COMP280 as optional module	**Minor**			