STUDENT HANDBOOK 2023-24 | APPENDIX B

- This School Student Handbook Appendix B file is applicable for Students registered for Undergraduate (BSc / BEng / MEng) and Postgraduate Taught (MSc) Programmes, which fall within the remit of the Department of Computer Science (CS).

- The School Student Handbook consists of three files:
  - Main
  - Appendix A (EEE)
  - Appendix B (CS)

PLEASE NOTE:

Information contained within this handbook file can be made available in an alternative format.

Please request this by sending an email to eeecssupport@ liverpool.ac.uk

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1. Programmes

1.1 Single Honours

This Appendix forms part of the School of Electrical Engineering, Electronics & Computer Science UG & PGT Student Handbook 2022–23, the 2023/24 version will be available when the new term starts in September 2023.

All of the programmes offered by the Department require students to take 120 credits in each year of study. This consists of required, optional and mandatory modules.

Every student on the Computer Science programmes takes the following required modules:

Year One	Year Two	Year Three/Four
• COMP101 or COMP105 • COMP107 • COMP108 • COMP109 • COMP111 • COMP116 • COMP122 • COMP124	• COMP201 • COMP207 • COMP202 • COMP208	• COMP390 (mandatory)

For Year in Industry/MEng students the following modules are also required:

Year in Industry	MEng only
• COMP299 • COMP221 (mandatory)	• COMP591 (mandatory) • COMP592 (mandatory)

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G40A (G400) BSc (Hons) Computer Science

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1
In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 2 Semester 1 Optional
60 credits are to be taken in Semester 1 and 60 credits are to be taken in Semester 2. Options totalling 30 credits from the optional modules provided pre-requisites are satisfied.
COMP105 cannot be taken again, if already taken in Year 1.
COMP221 can be taken as an option in Year 2 Semester 1 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.

Year 2 Semester 2 Optional
Options totalling 30 credits from the optional modules provided pre-requisites are satisfied.
COMP220 and COMP285 cannot be taken in conjunction.

Year 3 Semester 1 Optional
Options totalling 45 credits from the optional modules provided pre-requisites are satisfied. Should students wish to take ELEC319, they will also be required to take ELEC320 due to a credit imbalance. Students who wish to choose COMP335 will undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 3 Semester 2 Optional
Options totalling 45 credits from the optional modules provided pre-requisites are satisfied.

G40A – Computer Science					
Year 1 Semester 1 (G40A)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP101 or COMP105	4	Introduction to Programming Programming Language Paradigms	1	15	Required
COMP107	4	Designing systems for the Digital Society	1	15	Required
COMP109	4	Foundations of Computer Science	1	15	Required
COMP111	4	Introduction to Artificial Intelligence	1	15	Required
Year 1 Semester 2 (G40A)					
COMP108	4	Data Structures and Algorithms	2	15	Required
COMP116	4	Analytic Techniques for Computer Science	2	15	Required
COMP122	4	Object-Oriented Programming	2	15	Required
COMP124	4	Computer Systems	2	15	Required

G40A – Computer Science					
Year 2 Semester 1 (G40A)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP201	5	Software Engineering I	1	15	Required
COMP207	5	Database Development	1	15	Required

COMP105	4	Programming Language Paradigms	1	15	Optional
COMP211	5	Computer Networks	1	15	Optional
COMP218	5	Introduction to Theory of Computation	1	15	Optional
COMP219	5	Advanced Artificial Intelligence	1	15	Optional
COMP221	5	Planning your Career	1	7.5	Optional
COMP228	5	App Development	1	15	Optional
COMP229	5	Introduction to Data Science	1	15	Optional
Year 2 Semester 2					
COMP202	**5**	**Complexity of Algorithms**	**2**	**15**	**Required**
COMP208	**5**	**Group Software Project**	**2**	**15**	**Required**
COMP212	5	Distributed Systems	2	15	Optional
COMP220	5	Software Development Tools	2	15	Optional
COMP222	5	Principles of Computer Games Design and Implementation	2	15	Optional
COMP226	5	Computer-Based Trading in Financial Markets	2	15	Optional
COMP232	5	Cyber Security	2	15	Optional
COMP281	5	Principles of C and Memory Management	2	7.5	Optional
COMP282	5	The C++ Programming Language	2	7.5	Optional
COMP284	5	Scripting Languages	2	7.5	Optional
COMP285	5	Computer Aided Software Development	2	7.5	Optional

G40A – Computer Science					
Year 3 Semester 1 (G40A)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP390	**6**	**Honours Year Computer Science Project**	**1&2**	**30**	**Required**
COMP304	6	Knowledge Representation and Reasoning	1	15	Optional
COMP305	6	Biocomputation	1	15	Optional
COMP309	6	Efficient Sequential Algorithms	1	15	Optional
COMP319	6	Software Engineering II	1	15	Optional
COMP323	6	Introduction to Computational Game Theory	1	15	Optional
COMP329	6	Autonomous Mobile Robotics	1	15	Optional
COMP331	6	Optimisation	1	15	Optional
COMP335	6	Communicating Computer Science	1&2	15	Optional
COMP336	6	Big Data Analysis	1	15	Optional
COMP338	6	Computer Vision	1	15	Optional
ELEC319	6	Image Processing	1	7.5	Optional
Year 3 Semester 2 (G40A)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional

COMP318	6	Ontologies and semantic web	2	15	Optional
COMP324	6	Complex Information Networks	2	15	Optional
COMP326	6	Computational Game Theory and Mechanism Design	2	15	Optional
COMP328	6	High Performance Computing	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional
COMP341	6	Robot Perception and Manipulation	2	15	Optional
COMP342	6	Advanced Topic in Computer Game Development	2	15	Optional
COMP343	6	Computer Forensics	2	15	Optional
ELEC320	6	Neural Networks	2	7.5	Optional

G401 MEng (Hons) Computer Science

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1

In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 2 Semester 1 Optional

60 credits are to be taken in Semester 1 and 60 credits are to be taken in Semester 2. Options totalling 30 credits from the optional modules provided pre-requisites are satisfied.

COMP105 cannot be taken again, if already taken in Year 1.
COMP221 can be taken as an option in Year 2 Semester 1 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.

Year 2 Semester 2 Optional

Options totalling 30 credits from the optional modules provided pre-requisites are satisfied. COMP220 and COMP285 cannot be taken in conjunction.

Year 3 Semester 1 Optional

Options totalling 45 credits from the optional modules provided pre-requisites are satisfied. Should students wish to take ELEC319, they will also be required to take ELEC320 due to a credit imbalance. Students who wish to choose COMP335 will undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 3 Semester 2 Optional

Options totalling 45 credits from the optional modules provided pre-requisites are satisfied.

Year 4 Semester 1 Optional

Options totalling 30 credits from the following modules provided pre-requisites are satisfied.

Year 4 Semester 2 Optional

Options totalling 30 credits from the following modules provided pre-requisites are satisfied.

G401 - Computer Science MEng					
Year 1 Semester 1 (G401)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP101 or, COMP105	4	**Introduction to Programming** **Programming Language Paradigms**	1	15	**Required**
COMP107	4	**Designing systems for the Digital Society**	1	15	**Required**
COMP109	4	**Foundations of Computer Science**	1	15	**Required**
COMP111	4	**Introduction to Artificial Intelligence**	1	15	**Required**

Year 1 Semester 2 (G401)					
COMP108	4	Data Structures and Algorithms	2	15	Required
COMP116	4	Analytic Techniques for Computer Science	2	15	Required
COMP122	4	Object-Oriented Programming	2	15	Required
COMP124	4	Computer Systems	2	15	Required

G401 – Computer Science MEng					
Year 2 Semester 1 (G401)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP201	5	Software Engineering I	1	15	Required
COMP207	5	Database Development	1	15	Required
COMP105	4	Programming Language Paradigms	1	15	Optional
COMP211	5	Computer Networks	1	15	Optional
COMP218	5	Introduction to Theory of Computation	1	15	Optional
COMP219	5	Advanced Artificial Intelligence	1	15	Optional
COMP221	5	Planning your Career	1	7.5	Optional
COMP228	5	App Development	1	15	Optional
COMP229	5	Introduction to Data Science	1	15	Optional
Year 2 Semester 2 (G401)					
COMP202	5	Complexity of Algorithms	2	15	Required
COMP208	5	Group Software Project	2	15	Required
COMP212	5	Distributed Systems	2	15	Optional

COMP220	5	Software Development Tools	2	15	Optional
COMP222	5	Principles of Computer Games Design and Implementation	2	15	Optional
COMP226	5	Computer-Based Trading in Financial Markets	2	15	Optional
COMP232	5	Cyber Security	2	15	Optional
COMP281	5	Principles of C and Memory Management	2	7.5	Optional
COMP282	5	The C++ Programming Language	2	7.5	Optional
COMP284	5	Scripting Languages	2	7.5	Optional
COMP285	5	Computer Aided Software Development	2	7.5	Optional

G401 – Computer Science MEng					
Year 3 Semester 1 (G401)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP390	6	Honours Year Computer Science Project	1&2	30	Required
COMP304	6	Knowledge Representation and Reasoning	1	15	Optional
COMP305	6	Biocomputation	1	15	Optional
COMP309	6	Efficient Sequential Algorithms	1	15	Optional
COMP319	6	Software Engineering II	1	15	Optional
COMP323	6	Introduction to Computational Game Theory	1	15	Optional
COMP329	6	Autonomous Mobile Robotics	1	15	Optional
COMP331	6	Optimisation	1	15	Optional

COMP335	6	Communicating Computer Science	1&2	15	Optional
COMP336	6	Big Data Analysis	1	15	Optional
COMP338	6	Computer Vision	1	15	Optional
ELEC319	6	Image Processing	1	7.5	Optional

Year 3 Semester 2 (G401)

COMP310	6	Multi-Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional
COMP324	6	Complex Information Networks	2	15	Optional
COMP326	6	Computational Game Theory and Mechanism Design	2	15	Optional
COMP328	6	High Performance Computing	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional
COMP341	6	Robot Perception and Manipulation	2	15	Optional
COMP342	6	Advanced Topic in Computer Game Development	2	15	Optional
COMP343	6	Computer Forensics	2	15	Optional
ELEC320	6	Neural Networks	2	7.5	Optional

G401 – Computer Science MEng

Year 4 Semester 1 (G401)

Module Code	Level	Module Title	Semester	Credit	Type
COMP591	7	MEng Group Project	1	30	Required
COMP521	7	Knowledge Representation	1	15	Optional
COMP522	7	Privacy and Security	1	15	Optional
COMP526	7	Efficient Algorithms	1	15	Optional
COMP528	7	Multi-core and Multi-Processor Programming	1	15	Optional
COMP529	7	Big Data Analytics	1	15	Optional

Year 4 Semester 2 (G401)

COMP592	7	MEng Individual Project	2	30	Required
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional

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G403 BSc (Hons) Computer Science with a Year in Industry

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1 Required
In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 2 Semester 1 Optional
The credit balance should be 67.5 credits in Semester 1 (30 optional credits). Options are subject to pre-requisites having been satisfied.
COMP105 cannot be taken again, if already taken in Year 1.

Year 2 Semester 2 Optional
The credit balance should be 52.5 credits in Semester 2 (22.5 optional credits). Options are subject to pre-requisites having been satisfied.
COMP220 and COMP285 cannot be taken in conjunction.

UG students who are registered for Year in Industry programmes must pass their second year of study at first attempt in order to proceed to the placement year. Students who fail to do so will be transferred to the corresponding programme without a year in industry.

Year 3 - Industry Placement

Year 4 Semester 1 Optional
Options totalling 45 credits from the following modules provided pre-requisites are satisfied. Should students wish to take ELEC319, they will also be required to take ELEC320 due to a credit imbalance. Students who wish to choose COMP335 will undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 4 Semester 2 Optional
Options totalling 45 credits from the following modules provided pre-requisites are satisfied.

G403 - Computer Science with a Year in Industry					
Year 1 Semester 1 (G403)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP101 or COMP105	4	**Introduction to Programming** **Programming Language Paradigms**	1	15	**Required**
COMP107	4	**Designing systems for the Digital Society**	1	15	**Required**
COMP109	4	**Foundations of Computer Science**	1	15	**Required**
COMP111	4	**Introduction to Artificial Intelligence**	1	15	**Required**

Year 1 Semester 2 (G403)					
COMP108	4	**Data Structures and Algorithms**	2	15	**Required**
COMP116	4	**Analytic Techniques for Computer Science**	2	15	**Required**
COMP122	4	**Object-Oriented Programming**	2	15	**Required**
COMP124	4	**Computer Systems**	2	15	**Required**

G403 - Computer Science with a Year in Industry					
Year 2 Semester 1 (G403)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP201	5	**Software Engineering I**	1	15	**Required**

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COMP207	5	Database Development	1	15	Required
COMP221	5	Planning your Career	1	7.5	Required
COMP105	4	Programming Languages Paradigms	1	15	Optional
COMP211	5	Computer Networks	1	15	Optional
COMP218	5	Introduction to Theory of Computation	1	15	Optional
COMP219	5	Advanced Artificial Intelligence	1	15	Optional
COMP228	5	App Development	1	15	Optional
COMP229	5	Introduction to Data Science	1	15	Optional

Year 2 Semester 2 (G403)

COMP202	5	Complexity of Algorithms	2	15	Required
COMP208	5	Group Software Project	2	15	Required
COMP212	5	Distributed Systems	2	15	Optional
COMP220	5	Software Development Tools	2	15	Optional
COMP222	5	Principles of Computer Games Design and Implementation	2	15	Optional
COMP226	5	Computer-Based Trading in Financial Markets	2	15	Optional
COMP232	5	Cyber Security	2	15	Optional
COMP281	5	Principles of C and Memory Management	2	7.5	Optional
COMP282	5	The C++ Programming Language	2	7.5	Optional

COMP284	5	Scripting Languages	2	7.5	Optional
COMP285	5	Computer Aided Software Development	2	7.5	Optional

G403 – Computer Science with a Year in Industry

Year 3 Semester 1&2 (G403)

Module Code	Level	Module Title	Semester	Credit	Type
COMP299	5	Industrial Placement	1&2	120	Required

G403 – Computer Science with a Year in Industry

Year 4 Semester 1 (G403)

Module Code	Level	Module Title	Semester	Credit	Type
COMP390	6	Honours Year Computer Science Project	1&2	30	Required
COMP304	6	Knowledge Representation and Reasoning	1	15	Optional
COMP305	6	Biocomputation	1	15	Optional
COMP309	6	Efficient Sequential Algorithms	1	15	Optional
COMP319	6	Software Engineering II	1	15	Optional
COMP323	6	Introduction to Computational Game Theory	1	15	Optional
COMP329	6	Autonomous Mobile Robotics	1	15	Optional
COMP331	6	Optimisation	1	15	Optional
COMP335	6	Communicating Computer Science	1&2	15	Optional
COMP336	6	Big Data Analysis	1	15	Optional

COMP338	6	Computer Vision	1	15	Optional
ELEC319	6	Image Processing	1	7.5	Optional
Year 4 Semester 2 (G403)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional
COMP324	6	Complex Information Networks	2	15	Optional
COMP326	6	Computational Game Theory and Mechanism Design	2	15	Optional
COMP328	6	High Performance Computing	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional
COMP341	6	Robot Perception and Manipulation	2	15	Optional
COMP342	6	Advanced Topic in Computer Game Development	2	15	Optional
COMP343	6	Computer Forensics	2	15	Optional
ELEC320	6	Neural Networks	2	7.5	Optional

G404 MEng (Hons) Computer Science with a Year in Industry

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1 Required
In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 2 Semester 1 Optional
The credit balance should be 67.5 credits in Semester 1 (30 optional credits). Options are subject to pre-requisites having been satisfied.
COMP105 cannot be taken again, if already taken in Year 1.

Year 2 Semester 2 Optional
The credit balance should be 52.5 credits in Semester 2 (22.5 optional credits). Options are subject to pre-requisites having been satisfied.
COMP220 and COMP285 cannot be taken in conjunction.

UG students who are registered for Year in Industry programmes must pass their second year of study at first attempt in order to proceed to the placement year. Students who fail to do so will be transferred to the corresponding programme without a year in industry.

Year 3 – Industry Placement

Year 4 Semester 1 Optional
Options totalling 45 credits from the following modules provided pre-requisites are satisfied.

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Should students wish to take ELEC319, they will also be required to take ELEC320 due to a credit imbalance. Students who wish to choose COMP335 will undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 4 Semester 2 Optional
Options totalling 45 credits from the following modules provided pre-requisites are satisfied.

Year 5 Semester 1 Optional
Totalling 30 credits from the following modules provided pre-requisites are satisfied.
Year 5 Semester 2 Optional
Totalling 30 credits from the following modules provided pre-requisites are satisfied

G404 – Computer Science MEng with a Year in Industry					
Year 1 Semester 1 (G404)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP101 or COMP105	4	Introduction to Programming Programming Language Paradigms	1	15	Required
COMP107	4	Designing systems for the Digital Society	1	15	Required
COMP109	4	Foundations of Computer Science	1	15	Required
COMP111	4	Introduction to Artificial Intelligence	1	15	Required
Year 1 Semester 2 (G404)					
COMP108	4	Data Structures and Algorithms	2	15	Required
COMP116	4	Analytic Techniques for Computer Science	2	15	Required
COMP122	4	Object-Oriented Programming	2	15	Required

COMP124	4	Computer Systems	2	15	Required

G404 – Computer Science MEng with a Year in Industry					
Year 2 Semester 1 (G404)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP201	5	Software Engineering I	1	15	Required
COMP207	5	Database Development	1	15	Required
COMP221	5	Planning your Career	1	7.5	Required
COMP105	4	Programming Language Paradigms	1	15	Optional
COMP211	5	Computer Networks	1	15	Optional
COMP218	5	Introduction to Theory of Computation	1	15	Optional
COMP219	5	Advanced Artificial Intelligence	1	15	Optional
COMP228	5	App Development	1	15	Optional
COMP229	5	Introduction to Data Science	1	15	Optional
Year 2 Semester 2 (G404)					
COMP202	5	Complexity of Algorithms	2	15	Required
COMP208	5	Group Software Project	2	15	Required
COMP212	5	Distributed Systems	2	15	Optional
COMP220	5	Software Development Tools	2	15	Optional
COMP222	5	Principles of Computer Games Design and Implementation	2	15	Optional

COMP226	5	Computer-Based Trading in Financial Markets	2	15	Optional
COMP232	5	Cyber Security	2	15	Optional
COMP281	5	Principles of C and Memory Management	2	7.5	Optional
COMP282	5	The C++ Programming Language	2	7.5	Optional
COMP284	5	Scripting Languages	2	7.5	Optional
COMP285	5	Computer Aided Software Development	2	7.5	Optional

G404 – Computer Science MEng with a Year in Industry					
Year 3 Semester 1&2 (G404)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP299	**5**	**Industrial Placement**	**1&2**	**120**	**Required**

G404 – Computer Science MEng with a Year in Industry					
Year 4 Semester 1 (G404)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP390	**6**	**Honours Year Computer Science Project**	**1&2**	**30**	**Required**
COMP304	6	Knowledge Representation and Reasoning	1	15	Optional
COMP305	6	Biocomputation	1	15	Optional
COMP309	6	Efficient Sequential Algorithms	1	15	Optional
COMP319	6	Software Engineering II	1	15	Optional

COMP323	6	Introduction to Computational Game Theory	1	15	Optional
COMP329	6	Autonomous Mobile Robotics	1	15	Optional
COMP331	6	Optimisation	1	15	Optional
COMP335	6	Communicating Computer Science	1&2	15	Optional
COMP336	6	Big Data Analysis	1	15	Optional
COMP338	6	Computer Vision	1	15	Optional
ELEC319	6	Image Processing	1	7.5	Optional

Year 4 Semester 2 (G404)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional
COMP324	6	Complex Information Networks	2	15	Optional
COMP326	6	Computational Game Theory and Mechanism Design	2	15	Optional
COMP328	6	High Performance Computing	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional
COMP341	6	Robot Perception and Manipulation	2	15	Optional
COMP342	6	Advanced Topic in Computer Game Development	2	15	Optional
COMP343	6	Computer Forensics	2	15	Optional

ELEC320	6	Neural Networks	2	7.5	Optional

COMP575	7	Computational Intelligence	2	15	Optional

G404 – Computer Science MEng with a Year in Industry

Year 4 Semester 1 (G404)

Module Code	Level	Module Title	Semester	Credit	Type
COMP591	7	MEng Group Project	1	30	Required
COMP521	7	Knowledge Representation	1	15	Optional
COMP522	7	Privacy and Security	1	15	Optional
COMP526	7	Efficient Algorithms	1	15	Optional
COMP528	7	Multi-core and Multi-Processor Programming	1	15	Optional
COMP529	7	Big Data Analytics	1	15	Optional

Year 4 Semester 2 (G404)

Module Code	Level	Module Title	Semester	Credit	Type
COMP592	7	MEng Individual Project	2	30	Required
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional

Computer Science Pathway – Artificial Intelligence

This is an exciting and revolutionary field of Computer Science, with cutting-edge applications in areas as diverse intelligent robotics and autonomous vehicles, healthcare, law, climate change and computer games.

Artificial Intelligence Pathway
Year Two – For the Artificial Intelligence specialism pathway in addition to the required modules listed in the Computer Science programme structure above (G40A, G403, G401, G404), students must take COMP219 – Artificial Intelligence and at least 15 credits of the following optional modules below.

Module Code	Level	Module Title	Semester	Credit	Type
COMP219	5	Artificial Intelligence	1	15	Required
COMP218	5	Introduction to Theory of Computation	1	15	Optional
COMP229	5	Introduction to Data Science	1	15	Optional
COMP222	5	Principles of Computer Games Design and Implementation	2	15	Optional

Artificial Intelligence Pathway
Year Three/Four – For the Artificial Intelligence specialism pathway in addition to the required modules listed in the Computer Science programme structure above (G40A, G403, G401, G404), students must take at least 60 credits of the following optional modules below.

Module Code	Level	Module Title	Semester	Credit	Type
COMP304	6	Knowledge Representation and Reasoning	1	15	Optional
COMP305	6	Biocomputation	1	15	Optional
COMP329	6	Autonomous Mobile Robotics	1	15	Optional
COMP338	6	Computer Vision	1	15	Optional
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional
COMP341	6	Robot Perception and Manipulation	2	15	Optional

Artificial Intelligence Pathway

MEng Final Year Students – For the Artificial Intelligence specialism pathway in addition to the required modules listed in the Computer Science programme structure above (G40A, G403, G401, G404), students must take at least 60 credits of the following optional modules below.

Module Code	Level	Module Title	Semester	Credit	Type
COMP521	7	Knowledge Representation	1	15	Optional
COMP522	7	Privacy and Security	1	15	Optional
COMP526	7	Applied Algorithmics	1	15	Optional
COMP528	7	Multi-core and Multi-Processor Programming	1	15	Optional
COMP529	7	Big Data Analytics	1	15	Optional
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional

Computer Science Pathway – Algorithms and Optimisation

Algorithms are at the heart of every computer system. This specialism will introduce students to the fascinating world of design, analysis and the optimisation of algorithms, covering a wide range of relevant areas from finance to information security, and from biological systems to social networks.

Algorithms and Optimisation Pathway

Year Two – For the Algorithms and Optimisation specialism pathway in addition to the required modules listed in the Computer Science programme structure above (G40A, G403, G401, G404), and take at least 30 credits of the following optional modules below. COMP220 and COMP285 cannot be taken in conjunction.

Module Code	Level	Module Title	Semester	Credit	Type
COMP218	5	Introduction to Theory of Computation	1	15	Optional
COMP220	5	Introduction to Data Science	1	15	Optional
COMP226	5	Principles of Computer Games Design and Implementation	2	15	Optional
COMP284	5	Scripting Languages	2	7.5	Optional
COMP285	5	Computer Aided Software Development	2	7.5	Optional

Algorithms and Optimisation Pathway

Year Three/Four – For the Algorithms and Optimisation specialism pathway in addition to the required modules listed in the Computer Science programme structure above (G40A, G403, G401, G404), and take at least 60 credits of the following optional modules below.

Module Code	Level	Module Title	Semester	Credit	Type
COMP305	6	Biocomputation	1	15	Optional
COMP309	6	Efficient Sequential Algorithms	1	15	Optional
COMP323	6	Introduction to Computational Game Theory	1	15	Optional
COMP331	6	Optimisation	1	15	Optional
COMP336	6	Big Data Analysis	1	15	Optional
COMP324	6	Complex Information Networks	2	15	Optional
COMP326	6	Computational Game Theory and Mechanism Design	2	15	Optional

Algorithms and Optimisation Pathway

MEng Final Year Students – For the Algorithms and Optimisation specialism pathway in addition to the required modules listed in the Computer Science programme structure

above (G40A, G403, G401, G404), students must take at least 60 credits of the following optional modules below.

Module Code	Level	Module Title	Semester	Credit	Type
COMP521	7	Knowledge Representation	1	15	Optional
COMP522	7	Privacy and Security	1	15	Optional
COMP526	7	Applied Algorithmics	1	15	Optional
COMP528	7	Multi-core and Multi-Processor Programming	1	15	Optional
COMP529	7	Big Data Analytics	1	15	Optional
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional

Computer Science Pathway – Data Science

This prepares students to fill the looming employment gap in the field of big data analytics, especially in the context of the skills required with respect to the application of High Performance Computing capabilities to address large scale data intensive problems that occur in many fields.

Data Science Pathway
Year Two – For the Data Science specialism pathway in addition to the required modules listed in the Computer Science programme structure above (G40A, G403, G401, G404), students must take the following required modules below.

Module Code	Level	Module Title	Semester	Credit	Type
COMP219	5	Artificial Intelligence	1	15	Required
COMP229	5	Introduction to Data Science	1	15	Required
COMP281	5	Principles of C and Memory Management	2	7.5	Required
COMP284	5	Scripting Languages	2	7.5	Required

Data Science Pathway
Year Three/Four – For the Data Science specialism pathway in addition to the required modules listed in the Computer Science programme structure above (G40A, G403, G401, G404), students must take at least 60 credits of the following optional modules below.

Module Code	Level	Module Title	Semester	Credit	Type
COMP331	6	Knowledge Representation and Reasoning	1	15	Optional
COMP336	6	Big data Analytics	1	15	Optional
COMP329	6	Autonomous Mobile Robotics	1	15	Optional
ELEC319	6	Image Processing	1	7.5	Optional
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional
COMP343	6	Computer Forensics	2	15	Optional
ELEC320	6	Neural Networks	2	7.5	Optional

Data Science Pathway
MEng Final Year Students – For the Data Science specialism pathway in addition to the required modules listed in the Computer Science programme structure above (G40A, G403, G401, G404), students must take at least 60 credits of the following optional modules below.

Module Code	Level	Module Title	Semester	Credit	Type
COMP521	7	Knowledge Representation	1	15	Optional
COMP522	7	Privacy and Security	1	15	Optional
COMP526	7	Applied Algorithmics	1	15	Optional
COMP528	7	Multi-core and Multi-Processor Programming	1	15	Optional
COMP529	7	Big Data Analytics	1	15	Optional
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional

More detailed information can be found in the Programme Specifications, students are welcome to contact the Student Experience Team for more details about this.

GZ10 BSc (Hons) Computer Science with Software Development

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1 Required
In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 2 Semester 1 Optional
Options totalling 30 credits from the following modules provided pre-requisites are satisfied. COMP105 cannot be taken again, if already taken in Year 1.
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.

Year 2 Semester 2 Optional
Options totalling 30 credits from the following modules provided pre-requisites are satisfied.

Year 3 Semester 1 Optional
Options totalling 45 credits from the following modules provided pre-requisites are satisfied.

Students who wish to take ELEC319 will also be required to take ELEC320 to prevent a credit imbalance issue. Students who wish to choose COMP335 will undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 3 Semester 2 Optional
Options totalling 45 credits from the following modules provided pre-requisites are satisfied

GZ10 – Computer Science with Software Development					
Year 1 Semester 1 (GZ10)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP101 or, COMP105	4	Introduction to Programming Programming Language Paradigms	1	15	Required
COMP107	4	Designing systems for the Digital Society	1	15	Required
COMP109	4	Foundations of Computer Science	1	15	Required
COMP111	4	Introduction to Artificial Intelligence		15	Required

Year 1 Semester 2 (GZ10)					
COMP108	4	Data Structures and Algorithms	2	15	Required
COMP116	4	Analytic Techniques for Computer Science	2	15	Required
COMP122	4	Object-Oriented Programming	2	15	Required
COMP124	4	Computer Systems	2	15	Required

GZ10 – Computer Science with Software Development

Year 2 Semester 1 (GZ10)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP201	5	Software Engineering I	1	15	Required
COMP207	5	Database Development	1	15	Required
COMP105	4	Programming Language Paradigms	1	15	Optional
COMP211	5	Computer Networks	1	15	Optional
COMP218	5	Introduction to Theory of Computation	1	15	Optional
COMP219	5	Advanced Artificial Intelligence	1	15	Optional
COMP221	5	Planning your Career	1	7.5	Optional
COMP228	5	App Development	1	15	Optional
COMP229	5	Introduction to Data Science	1	15	Optional
COMP212	5	Distributed Systems	2	15	Optional
COMP222	5	Principles of Computer Games Design and Implementation	2	15	Optional
COMP226	5	Computer-Based Trading in Financial Markets	2	15	Optional
COMP232	5	Cyber Security	2	15	Optional
COMP281	5	Principles of C and Memory Management	2	7.5	Optional
COMP282	5	The C++ Programming Language	2	7.5	Optional
COMP284	5	Scripting Languages	2	7.5	Optional

Year 2 Semester 2 (GZ10)					
COMP208	5	Group Software Project	2	15	Required
COMP220	5	Software Development Tools	2	15	Required
COMP202	5	Complexity of Algorithms	2	15	Optional

GZ10 – Computer Science with Software Development					
Year 3 Semester 1 (GZ10)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP390	6	Honours Year Computer Science Project	1&2	30	Required
COMP304	6	Knowledge Representation and Reasoning	1	15	Optional
COMP305	6	Biocomputation	1	15	Optional
COMP309	6	Efficient Sequential Algorithms	1	15	Optional
COMP319	6	Software Engineering II	1	15	Optional
COMP323	6	Introduction to Computational Game Theory	1	15	Optional
COMP329	6	Autonomous Mobile Robotics	1	15	Optional

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COMP331	6	Optimisation	1	15	Optional
COMP335	6	Communicating Computer Science	1&2	15	Optional
COMP336	6	Big Data Analysis	1	15	Optional
COMP338	6	Computer Vision	1	15	Optional
ELEC319	6	Image Processing	1	7.5	Optional
Year 3 Semester 2 (GZ10)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional
COMP324	6	Complex Information Networks	2	15	Optional
COMP326	6	Computational Game Theory and Mechanism Design	2	15	Optional
COMP328	6	High Performance Computing	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional
COMP341	6	Robot Perception and Manipulation	2	15	Optional
COMP342	6	Advanced Topic in Computer Game Development	2	15	Optional
COMP343	6	Computer Forensics	2	15	Optional
ELEC320	6	Neural Networks	2	7.5	Optional

G61Z BSc (Hons) Computer Science with Software Development with a Year in Industry

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1 Required
In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 2 Semester 1 Optional
The credit balance should be 67.5 credits in Semester 1 (30 optional credits). Options are subject to pre-requisites having been satisfied.
COMP105 cannot be taken again, if already taken in Year 1.

Year 2 Semester 2 Optional
The credit balance should be 52.5 credits in Semester 2 (22.5 optional credits). Options are subject to pre-requisites having been satisfied.

UG students who are registered for Year in Industry programmes must pass their second year of study at first attempt in order to proceed to the placement year. Students who fail to do so will be transferred to the corresponding programme without a year in industry.

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Year 3 – Industry Placement

Year 4 Semester 1 Optional
Options totalling 45 credits from the following modules provided pre-requisites are satisfied. Students who wish to take ELEC319 will also be required to take ELEC320 to prevent a credit imbalance issue. Students who wish to choose COMP335 will undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 4 Semester 2 Optional
Options totalling 45 credits from the following modules provided pre-requisites are satisfied.

G61Z – Computer Science with Software Development with a Year in Industry					
Year 1 Semester 1 (G61Z)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP101 or, COMP105	4	Introduction to Programming Programming Language Paradigms	1	15	Required
COMP107	4	Designing systems for the Digital Society	1	15	Required
COMP109	4	Foundations of Computer Science	1	15	Required
COMP111	4	Introduction to Artificial Intelligence	1	15	Required
Year 1 Semester 2 (G61Z)					
COMP108	4	Data Structures and Algorithms	2	15	Required
COMP116	4	Analytic Techniques for Computer Science	2	15	Required
COMP122	4	Object-Oriented Programming	2	15	Required
COMP124	4	Computer Systems	2	15	Required

G61Z – Computer Science with Software Development with a Year in Industry					
Year 2 Semester 1 (G61Z)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP201	5	Software Engineering I	1	15	Required
COMP207	5	Database Development	1	15	Required
COMP221	5	Planning your Career	1	7.5	Required
COMP105	4	*Programming Language Paradigms*	*1*	*15*	*Optional*
COMP211	5	*Computer Networks*	*1*	*15*	*Optional*
COMP218	5	*Introduction to Theory of Computation*	*1*	*15*	*Optional*
COMP219	5	*Advanced Artificial Intelligence*	*1*	*15*	*Optional*
COMP228	5	*App Development*	*1*	*15*	*Optional*
COMP229	5	*Introduction to Data Science*	*1*	*15*	*Optional*
Year 2 Semester 2 (G61Z)					
COMP208	5	Group Software Project	2	15	Required
COMP220	5	Software Development Tools	2	15	Required

Module Code	Level	Module Title	Semester	Credit	Type
COMP202	5	Complexity of Algorithms	2	15	Optional
COMP212	5	Distributed Systems	2	15	Optional
COMP222	5	Principles of Computer Games Design and Implementation	2	15	Optional
COMP226	5	Computer–Based Trading in Financial Markets	2	15	Optional
COMP232	5	Cyber Security	2	15	Optional
COMP281	5	Principles of C and Memory Management	2	7.5	Optional
COMP282	5	The C++ Programming Language	2	7.5	Optional
COMP284	5	Scripting Languages	2	7.5	Optional

G61Z – Computer Science with Software Development with a Year in Industry

Year 3 Semester 1&2 (G61Z)

Module Code	Level	Module Title	Semester	Credit	Type
COMP299	5	Industrial Placement	1&2	120	Required

G61Z – Computer Science with Software Development with a Year in Industry

Year 3 Semester 1 (G61Z)

Module Code	Level	Module Title	Semester	Credit	Type
COMP390	6	Honours Year Computer Science Project	1&2	30	Required
COMP304	6	Knowledge Representation and Reasoning	1	15	Optional
COMP305	6	Biocomputation	1	15	Optional
COMP309	6	Efficient Sequential Algorithms	1	15	Optional
COMP319	6	Software Engineering II	1	15	Optional
COMP323	6	Introduction to Computational Game Theory	1	15	Optional
COMP329	6	Autonomous Mobile Robotics	1	15	Optional
COMP331	6	Optimisation	1	15	Optional
COMP335	6	Communicating Computer Science	1&2	15	Optional
COMP336	6	Big Data Analysis	1	15	Optional
COMP338	6	Computer Vision	1	15	Optional
ELEC319	6	Image Processing	1	7.5	Optional

Year 3 Semester 2 (G61Z)

Module Code	Level	Module Title	Semester	Credit	Type
COMP310	6	Multi–Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP315	6	Cloud Computing for E–Commerce	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional
COMP324	6	Complex Information Networks	2	15	Optional
COMP326	6	Computational Game Theory and Mechanism Design	2	15	Optional
COMP328	6	High Performance Computing	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional

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COMP341	6	Robot Perception and Manipulation	2	15	Optional
COMP342	6	Advanced Topic in Computer Game Development	2	15	Optional
COMP343	6	Computer Forensics	2	15	Optional
ELEC320	6	Neural Networks	2	7.5	Optional

1.2 Joint Honours

GG14 (GG1A) BSc (Hons) Mathematics and Computer Science

This programme combines the theory and practice of mathematics and computer science. The programme provides theoretical knowledge in mathematics that is fundamental to the computer science discipline and introduces concrete applications in computer science. Students will develop initiative by tackling problems in a rational analytic manner and forming balanced judgements.

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1 Required
In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 1 Semester 2 Optional
Options totalling 15 credits from the modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year

Year 2 Semester 1 Optional – COMP
Options totalling 30 credits from the COMP modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

Year 2 Semester 1 Optional – MATH
Options totalling 30 credits from the MATH modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

Year 2 Semester 2 Optional – COMP
Options from modules totalling 15 credits from the following, provided pre-requisites are satisfied. If COMP232 is selected for semester 2, please note that COMP211 needs to be taken in semester 1.

Year 2 Semester 2 Optional – MATH
Options from modules totalling 30 credits from the following, provided pre-requisites are satisfied. It is highly recommended for students to select MATH226.
Each student is required to be registered for 120 credits in total for the academic year.

Year 3 Semester 1 Optional – COMP
Options totalling 30 credits from the COMP modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

Year 3 Semester 1 Optional – MATH
Options totalling 30 credits from the MATH modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

Year 3 Semester 2 Optional – COMP
Options totalling 30 credits from the COMP modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year. Selecting COMP392 is highly recommended. Students who wish to choose COMP335 module will

undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 3 Semester 2 Optional – MATH
Options totalling 30 credits from the MATH modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

GG1A – Mathematics and Computer Science					
Year 1 Semester 1 (GG1A)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP101 or, COMP105	4	Introduction to Programming Programming Language Paradigms	1	15	Required
COMP107	4	Designing systems for the Digital Society	1	15	Required
MATH101	4	Calculus I	1	15	Required
MATH103	4	Introduction to Linear Algebra	1	15	Required
Year 1 Semester 2 (GG1A)					
MATH102	4	Calculus II	2	15	Required
COMP108	4	Data Structures and Algorithms	2	15	Required
COMP122	4	Object-Oriented Programming	2	15	Required
MATH122	4	Newtonian Mechanics	2	15	Optional

MATH142	4	Numbers, Groups and Codes	2	15	Optional
MATH163	4	Introduction to Statistics using R	2	15	Optional

GG1A – Mathematics and Computer Science					
Year 2 Semester 1 (GG1A)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP111	4	Introduction to Artificial Intelligence	1	15	Optional
COMP201	5	Software Engineering I	1	15	Optional
COMP207	5	Database Development	1	15	Optional
COMP211	5	Computer Networks	1	15	Optional
COMP218	5	Introduction to Theory of Computation	1	15	Optional
MATH225	5	Vector Calculus with Apps	1	15	Optional
MATH243	5	Complex Functions	1	15	Optional
MATH244	5	Linear Algebra and Geometry	1	15	Optional
MATH253	5	Statistics and Probability I	1	15	Optional
MATH268	5	Oper Res: Probabilistic Models	1	15	Optional
Year 2 Semester 2 (GG1A)					

COMP202	5	Complexity of Algorithms	2	15	Required
COMP124	4	Computer Systems	2	15	Optional
COMP208	5	Group Software Project	2	15	Optional
COMP212	5	Distributed Systems	2	15	Optional
COMP222	5	Principles of Computer Games Design and Implementation	2	15	Optional
COMP226	5	Computer-Based Trading in Financial Markets	2	15	Optional
COMP232	5	Cyber Security	2	15	Optional
MATH228	5	Classical Mechanics	2	15	Optional
MATH247	5	Commutative Algebra	2	15	Optional
MATH260	5	Financial Mathematics	2	15	Optional
MATH221	5	Differential Equations	2	15	Optional
MATH254	5	Statistics and Probability II	2	15	Optional
MATH242	5	Metric Spaces & Calculus	2	15	Optional
MATH269	5	Operational Research	2	15	Optional
MATH226	5	Numerical Methods for Applied	2	15	Optional

GG1A – Mathematics and Computer Science					
Year 3 Semester 1 (GG1A)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP219	5	Advanced Artificial Intelligence	1	15	Optional
COMP304	6	Knowledge Representation and Reasoning	1	15	Optional
COMP305	6	Biocomputation	1	15	Optional
COMP309	6	Efficient Sequential Algorithms	1	15	Optional
COMP319	6	Software Engineering II	1	15	Optional
COMP323	6	Introduction to Computational Game Theory	1	15	Optional
COMP331	6	Optimisation	1	15	Optional
COMP335	6	Communicating Computer Science	1&2	15	Optional
MATH323	6	Further Methods of App. Math	1	15	Optional
MATH324	6	Cart Ten & Math Mod of Sol & Visc	1	15	Optional
MATH325	6	Quantum Mechanics	1	15	Optional
MATH342	6	Number Theory	1	15	Optional

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MATH343	6	Group Theory	1	15	Optional
MATH326	6	Relativity	1	15	Optional
MATH349	6	Differential Geometry	1	15	Optional
MATH362	6	Applied Probability	1	15	Optional
MATH363	6	Linear Statistical Models	1	15	Optional

Year 3 Semester 2 (GG1A)

COMP310	6	Multi-Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP324	6	Complex Information Networks	2	15	Optional
COMP326	6	Computational Game Theory and Mechanism Design	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional
COMP342	6	Advanced Topic in Computer Game Development	2	15	Optional
COMP392	6	Final Year Second Semester 15 Credit Project	2	15	Optional

MATH331	6	Game Theory	2	15	Optional
MATH344	6	Combinatorics	2	15	Optional
MATH361	6	Theory of Statist Inference	2	15	Optional
MATH364	6	Medical Statistics	2	15	Optional
MATH366	6	Mathematical Risk Theory	2	15	Optional
MATH367	6	Net in Theory & Practice	2	15	Optional

GG16 BSc (Hons) Mathematics and Computer Science with a Year in Industry

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1 Required
In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 1 Semester 2 Optional
Options totalling 15 credits from the modules provided pre-requisites are satisfied - all students are required to be registered for 120 credits in total for the academic year.

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Year 2 Semester 1 Optional – COMP

Options totalling 30 credits from the COMP modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

Year 2 Semester 1 Optional – MATH

Options totalling 30 credits from the MATH modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

Year 2 Semester 2 Optional – COMP

Options from modules totalling 15 credits from the following, provided pre-requisites are satisfied. If COMP232 is selected for semester 2, please note that COMP211 needs to be taken in semester 1.

Year 2 Semester 2 Optional – MATH

Options from modules totalling 30 credits from the following, provided pre-requisites are satisfied. It is highly recommended for students to select MATH226.
Each student is required to be registered for 120 credits in total for the academic year.

UG students who are registered for Year in Industry programmes must pass their second year of study at first attempt in order to proceed to the placement year. Students who fail to do so will be transferred to the corresponding programme without a year in industry.

Year 3 – Industry Placement

Year 4 Semester 1 Optional – COMP

Options totalling 30 credits from the COMP modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

Year 4 Semester 1 Optional – MATH

Options totalling 30 credits from the MATH modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

Year 4 Semester 2 Optional – COMP

Options totalling 30 credits from the COMP modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.
Selecting COMP392 is highly recommended, but not mandatory. Students who wish to choose

COMP335 module will undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 4 Semester 2 Optional – MATH

Options totalling 30 credits from the MATH modules provided pre-requisites are satisfied – all students are required to be registered for 120 credits in total for the academic year.

GG16 – Mathematics and Computer Science with a Year in Industry					
Year 1 Semester 1 (GG16)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP101 or, COMP105	4	Introduction to Programming Programming Language Paradigms	1	15	Required
COMP107	4	Designing systems for the Digital Society	1	15	Required
MATH101	4	Calculus I	1	15	Required
MATH103	4	Introduction to Linear Algebra	1	15	Required
Year 1 Semester 2 (GG16)					
MATH102	4	Calculus II	2	15	Required
COMP108	4	Data Structures and Algorithms	2	15	Required
COMP122	4	Object-Oriented Programming	2	15	Required
MATH122	*4*	*Newtonian Mechanics*	*2*	*15*	*Optional*

MATH142	4	Numbers, Groups and Codes	2	15	Optional
MATH163	4	Introduction to Statistics using R	2	15	Optional

GG16 – Mathematics and Computer Science with a Year in Industry

Year 2 Semester 1 (GG16)

Module Code	Level	Module Title	Semester	Credit	Type
COMP111	5	Introduction to Artificial Intelligence	1	15	Optional
COMP201	5	Software Engineering I	1	15	Optional
COMP207	5	Database Development	1	15	Optional
COMP211	5	Computer Networks	1	15	Optional
COMP218	5	Introduction to Theory of Computation	1	15	Optional
MATH225	5	Vector Calculus with Apps	1	15	Optional
MATH243	5	Complex Functions	1	15	Optional
MATH244	5	Linear Algebra and Geometry	1	15	Optional
MATH253	5	Statistics and Probability I	1	15	Optional
MATH268	5	Oper Res: Probabilistic Models	1	15	Optional

Year 2 Semester 2 (GG16)

COMP202	5	Complexity of Algorithms	2	15	Required
COMP124	5	Computer Systems	2	15	Optional
COMP208	5	Group Software Project	2	15	Optional
COMP212	5	Distributed Systems	2	15	Optional
COMP222	5	Principles of Computer Games Design and Implementation	2	15	Optional
COMP226	5	Computer–Based Trading in Financial Markets	2	15	Optional
COMP232	5	Cyber Security	2	15	Optional
MATH228	5	Classical Mechanics	2	15	Optional
MATH247	5	Commutative Algebra	2	15	Optional
MATH260	5	Financial Mathematics	2	15	Optional
MATH221	5	Differential Equations	2	15	Optional
MATH254	5	Statistics and Probability II	2	15	Optional
MATH242	5	Metric Spaces & Calculus	2	15	Optional
MATH269	5	Operational Research	2	15	Optional

Module Code	Level	Module Title	Semester	Credit	Type
MATH226	5	Numerical Methods for Applied	2	15	Optional

GG16 – Mathematics and Computer Science with a Year in Industry					
Year 3 Semester 1&2 (GG16)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP299	5	Industrial Placement	1&2	120	Required

GG16 – Mathematics and Computer Science with a Year in Industry					
Year 3 Semester 1 (GG16)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP219	5	Advanced Artificial Intelligence	1	15	Optional
COMP304	6	Knowledge Representation and Reasoning	1	15	Optional
COMP305	6	Biocomputation	1	15	Optional
COMP309	6	Efficient Sequential Algorithms	1	15	Optional
COMP319	6	Software Engineering II	1	15	Optional
COMP323	6	Introduction to Computational Game Theory	1	15	Optional

Module Code	Level	Module Title	Semester	Credit	Type
COMP331	6	Optimisation	1	15	Optional
COMP335	6	Communicating Computer Science	1&2	15	Optional
MATH323	6	Further Methods of App. Math	1	15	Optional
MATH324	6	Cart Ten & Math Mod of Sol & Visc	1	15	Optional
MATH325	6	Quantum Mechanics	1	15	Optional
MATH326	6	Relativity	1	15	Optional
MATH342	6	Number Theory	1	15	Optional
MATH343	6	Group Theory	1	15	Optional
MATH349	6	Differential Geometry	1	15	Optional
MATH362	6	Applied Probability	1	15	Optional
MATH363	6	Linear Statistical Models	1	15	Optional
Year 3 Semester 2 (GG16)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP313	6	Formal Methods	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional

COMP324	6	Complex Information Networks	2	15	Optional
COMP326	6	Computational Game Theory and Mechanism Design	2	15	Optional
COMP337	6	Data Mining and Visualisation	2	15	Optional
COMP342	6	Advanced Topic in Computer Game Development	2	15	Optional
COMP392	6	Final Year Second Semester 15 Credit Project	2	15	Optional
MATH331	6	Game Theory	2	15	Optional
MATH344	6	Combinatorics	2	15	Optional
MATH361	6	Theory of Statist Inference	2	15	Optional
MATH364	6	Medical Statistics	2	15	Optional
MATH366	6	Mathematical Risk Theory	2	15	Optional
MATH367	6	Net in Theory & Practice	2	15	Optional

GN34 BSc (Hons) Financial Computing

Financial Computing is the provision of financial services and markets using electronic communication and computation. This programme is designed to address the demand for graduates who have both the necessary computer skills and the knowledge of financial products to build finance applications. This programme is based in the Department of Computer Science and is taught in conjunction with the Management School.

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see .

Year 1 Semester 1
In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 2 Semester 2 Optional
Options totalling 15 credits from the following five modules provided pre-requisites are satisfied – each student needs to be registered for 120 credits in total for the academic year.

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Year 3 Semester 1 Optional

Options totalling 15 credits from the following five modules provided pre-requisites are satisfied – each student needs to be registered for 120 credits in total for the academic year. Students who wish to choose COMP335 module will undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 3 Semester 2 Optional

Options totalling 30 credits from the following five modules provided pre-requisites are satisfied – each student needs to be registered for 120 credits in total for the academic year.

GN34 – Financial Computing					
Year 1 Semester 1 (GN34)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP101 or, COMP105	4	Introduction to Programming Programming Language Paradigms	1	15	Required
COMP107	4	Designing systems for the Digital Society	1	15	Required
ACFI101	4	Introduction to Financial Accounting	1	15	Required
ECON121	4	Principles of Microeconomics	1	15	Required

Year 1 Semester 2 (GN34)					
COMP116	4	Analytic Techniques for Computer Science	2	15	Required
COMP122	4	Object-Oriented Programming	2	15	Required
ACFI102	4	Introduction to Management Accounting	2	15	Required
ACFI103	4	Introduction to Finance	2	15	Required

GN34 – Financial Computing					
Year 2 Semester 1 (GN34)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP201	5	Software Engineering I	1	15	Required
COMP207	5	Database Development	1	15	Required
ACFI201	5	Financial Reporting 1	1	15	Required
ACFI213	5	Corporate Financial Management for Non-Specialist Students	1	15	Required
Year 2 Semester 2 (GN34)					
COMP208	5	Group Software Project	2	15	Required
COMP226	5	Computer-Based Trading in Financial Markets	2	15	Required
ECON241	5	Securities Markets	2	15	Required
COMP284	5	Scripting Languages	2	7.5	Optional

Module Code	Level	Module Title	Semester	Credit	Type
COMP285	5	Comp Aided Software Development	2	7.5	Optional
ACFI202	5	Accounting Theory	2	15	Optional
MKIB225	5	Business in the Global Economy	2	15	Optional

GN34 – Financial Computing

Year 3 Semester 1 (GN34)

Module Code	Level	Module Title	Semester	Credit	Type
COMP396	6	Honours Year Automated Trading Project	1&2	30	Required
COMP323	6	Introduction to Computational Game Theory	1	15	Required
ACFI304	6	Business Finance	1	15	Required
COMP319	6	Software Engineering II	1	15	Optional
COMP331	6	Optimisation	1	15	Optional
COMP335	6	Communicating Computer Science	1&2	15	Optional
ACFI309	6	Financial Reporting 2	1	15	Optional
EBUS301	6	E-Business Models and Strategy	1	15	Optional

Year 3 Semester 2 (GN34)

Module Code	Level	Module Title	Semester	Credit	Type
ACFI342	6	Financial Risk Management	2	15	Required

Module Code	Level	Module Title	Semester	Credit	Type
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP326	6	Computational Game Theory	2	15	Optional
ACFI302	6	Corporate Reporting & Analysis	2	15	Optional
MKIB351	6	Global Strategic Management	2	15	Optional

G3N4 BSc (Hons) Financial Computing with a Year in Industry

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1
In Year 1 students will study one of the modules COMP101 (Introduction 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 (e.g. 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.

Year 2 Semester 2 Optional
Options totalling 15 credits from the following five modules provided pre-requisites are satisfied - each student needs to be registered for 120 credits in total for the academic year.

UG students who are registered for Year in Industry programmes must pass their second year of study at first attempt in order to proceed to the placement year. Students who fail to do so will be transferred to the corresponding programme without a year in industry.

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Year 3 – Industry Placement

Year 4 Semester 1 Optional
Options totalling 15 credits from the following five modules provided pre-requisites are satisfied – each student needs to be registered for 120 credits in total for the academic year. Students who wish to choose COMP335 module will undergo an interview with the Module Co-ordinator before being selected. If COMP335 is taken, an imbalance of 15 credits between the two semesters is allowed.

Year 4 Semester 2 Optional
Options totalling 30 credits from the following five modules provided pre-requisites are satisfied – each student needs to be registered for 120 credits in total for the academic year.

G3N4 – Financial Computing with a Year in Industry					
Year 1 Semester 1 (G3N4)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP101 or, COMP105	4	Introduction to Programming Programming Language Paradigms	1	15	Required
COMP107	4	Designing systems for the Digital Society	1	15	Required
ACFI101	4	Introduction to Financial Accounting	1	15	Required
ECON121	4	Principles of Micro	1	15	Required

Year 1 Semester 2 (G3N4)					
COMP116	4	Analytic Techniques for Computer Science	2	15	Required

COMP122	4	Object-Oriented Programming	2	15	Required
ACFI103	4	Introduction to Finance	2	15	Required
ACFI102	4	Management Accounting	2	15	Required

GN34 – Financial Computing					
Year 2 Semester 1 (G3N4)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP201	5	Software Engineering I	1	15	Required
COMP207	5	Database Development	1	15	Required
ACFI201	5	Financial Reporting 1	1	15	Required
ACFI213	5	Corporate Financial Management for Non-Specialist Students	1	15	Required
Year 2 Semester 2 (G3N4)					
COMP208	5	Group Software Project	2	15	Required
COMP226	5	Computer-Based Trading in Financial Markets	2	15	Required
ECON241	5	Securities Markets	2	15	Required
COMP284	*5*	*Scripting Languages*	*2*	*7.5*	*Optional*

Module Code	Level	Module Title	Semester	Credit	Type
COMP285	5	Comp Aided Software Development	2	7.5	Optional
ACFI202	5	Accounting Theory	2	15	Optional
MKIB225	5	Business in the Global Economy	2	15	Optional

G3N4 – Financial Computing with a Year in Industry					
Year 3 Semester 1&2 (G3N4)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP299	5	Industrial Placement	1&2	120	Required

GN34 – Financial Computing					
Year 3 Semester 1 (G3N4)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP396	6	Honours Year Automated Trading Project	1&2	30	Required
COMP323	6	Introduction to Computational Game Theory	1	15	Required
ACFI304	6	Business Finance	1	15	Required
COMP319	6	Software Engineering II	1	15	Optional
COMP331	6	Optimisation	1	15	Optional

COMP335	6	Communicating Computer Science	1&2	15	Optional
ACFI309	6	Financial Reporting 2	1	15	Optional
EBUS301	6	E-Business Models and Strategy	1	15	Optional

Year 3 Semester 2 (G3N4)					
ACFI342	6	Financial Risk Management	2	15	Required
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP326	6	Computational Game Theory	2	15	Optional
ACFI302	6	Corporate Reporting & Analysis	2	15	Optional
MKIB351	6	Global Strategic Management	2	15	Optional

1.3 PGT Programmes

This Appendix forms part of the School of Electrical Engineering, Electronics & Computer Science UG & PGT Student Handbook 2022–23, the 2023/24 version will be available when the new term starts in September 2023.

All of the PGT programmes offered by the Department require students to take 180 credits in each year of study, or 240 for PGT Year in Industry Programmes. This consists of required, optional and mandatory modules.

CSMS MSc Computer Science

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Students follow either Full-Time Pathway of one-year duration, or Part-Time Pathway of minimum of two years and maximum of six years duration.

_____
Full-time:
_____

The programme is divided into three, equally weighted semesters. The first two, which are run concurrently with the normal undergraduate semesters, comprise taught modules to a total of 60 credits per semester. An extended research based project, culminating in a dissertation, is undertaken full time over the summer period. This counts for a further 60 credits, making a total of 180.

At least 90 credits of the 120 taught credits available in the first two semesters must comprise level '7' modules. The remaining 30 may include selected level 6 modules with the proviso that a graduates of the University of Liverpool cannot elect to take a level 6 module if they have already taken that module as part of their undergraduate study.

Semester1
60 credits of required modules.

Semester 2
Options totalling 60 credits from the following ten modules provided pre-requisites are satisfied.

No more than 30 credits of level 6 modules can be selected.

Semester 3
COMP702 is the MSc 60 credit project module that will run over the summer from the week after the semester 2 exams to approximately one week before the start of the next academic year.

CSMS – MSc Computer Science

Module Code	Level	Module Title	Semester	Credit	Type
Year 1 Semester 1 (CSMS)					
COMP516	7	Research Methods in Computer Science	1	15	Required
COMP517	7	Programming Fundamentals	1	15	Required
COMP518	7	Database and Information Systems	1	15	Required
COMP526	7	Efficient Algorithms	1	15	Required
Year 1 Semester 2 (CSMS)					
COMP519	7	Web Programming	2	15	Required
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP530	7	MSc Group Project	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional

COMP575	7	Computational Intelligence	2	15	Optional
ENVS456	7	Web Mapping and Analysis	2	15	Optional
Year 1 Semester 3 (CSMS)					
COMP702	7	MSc Project	Summer	60	Required

CSMS MSc Computer Science Part-time

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

From the set of taught modules available for full-time pathway students select modules totalling 120 credit points over period of minimum of two years and maximum of six years. The particular choice of modules over the years and semesters may be arbitrary provided the pre-requisites and conditions specified for full-time mode are satisfied. The further 60 credit points come from COMP702 (MSc Final Project) which is undertaken over the summer semester after all 120 credit points of taught modules are collected.

Note: for the part-time pathway the department cannot guarantee availability of modules for the whole duration of the programme. If a module becomes unavailable then it will be substituted by an alternative module in accordance with a modified programme specification or by approval of the appropriate Director of Studies.

Year 1 Semester 2 Part-time
Options totalling 30 credits from the optional modules provided in the table below, provided pre-requisites are satisfied.

Unfortunately no timetabling availability can be guaranteed for optional modules.

No more than 30 credits of level 6 modules can be selected.

Year 2 Semester 2 Part-time
Options totalling 15 credits from the optional modules provided in the table below, provided pre-requisites are satisfied.

Unfortunately no timetabling availability can be guaranteed for the optional modules.

No more than 30 credits of level 6 modules can be selected.

CSMS – MSc Computer Science Part-Time					
Year 1 Semester 1 (CSMS)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP517	7	Programming Fundamentals	1	15	Required
COMP518	7	Database and Information Systems	1	15	Required
Year 1 Semester 2 (CSMS)					
COMP524	7	Safety and Dependability	2	15	Optional
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional

Module Code	Level	Module Title	Semester	Credit	Type
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
ENVS456	7	Web Mapping and Analysis	2	15	Optional

CSMS – MSc Computer Science Part-Time					
Year 2 Semester 1 (CSMS)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP516	**7**	**Research Methods in Computer Science**	**1**	**15**	**Required**
COMP526	**7**	**Efficient Algorithms**	**1**	**15**	**Required**
Year 2 Semester 2 (CSMS)					
COMP519	**7**	**Web Programming**	**2**	**15**	**Required**
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional
Year 2 Semester 2 (CSMS)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP318	6	Ontologies and semantic web	2	15	Optional
COMP530	7	MSc Group Project	2	15	Optional

COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
ENVS456	7	Web Mapping and Analysis	2	15	Optional
Year 2 Semester 3 (CSMS)					
COMP702	7	MSc Project	Summer	60	Required

CSAD MSc Advanced Computer Science

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Students follow either Full-Time Pathway of one-year duration, or Part-Time Pathway of minimum of two years and maximum of six years duration.

The programme is divided into three, equally weighted semesters. The first two, which are run concurrently with the normal undergraduate semesters, comprise taught modules to a total of 60 credits per semester. An extended research based project, culminating in a dissertation, is undertaken full time over the summer period. This counts for a further 60 credits, making a total of 180.

At least 90 credits of the 120 taught credits available in the first two semesters must comprise level '7' modules. The remaining 30 may include selected level 6 modules with the proviso that a graduates of the University of Liverpool cannot elect to take a level 6 module if they have already taken that module as part of their undergraduate study.

Each full-time student must be registered for 180 credits in total, which includes the project module.

Semester 1

Options totalling 45 credits from the following modules provided pre-requisites are satisfied.
Please note that ELEC415 and ELEC319 must be taken as a pair.
No more than 30 credits of level 6 optional modules can be selected.
Each full-time PGT student is required to take 180 credits in total, including the project module.

Semester 2

Options totalling 60 credits from the following modules provided pre-requisites are satisfied.
Please note that ELEC415 and ELEC319 must be taken as a pair.
No more than 30 credits of level 6 optional modules can be selected.

Semester 3

COMP702 is the MSc 60 credit project module that will run over the summer from the week after the semester 2 exams to approximately one week before the start of the next academic year.

CSAD – MSc Advanced Computer Science					
Year 1 Semester 1 (CSAD)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP516	**7**	**Research Methods in Computer Science**	**1**	**15**	**Required**
COMP521	7	Knowledge Representation	1	15	Optional
COMP522	7	Privacy and Security	1	15	Optional
COMP526	7	Efficient Algorithms	1	15	Optional
COMP528	7	Multi-core and Multi-Processor Programming	1	15	Optional
COMP557	7	Optimisation	1	15	Optional
ELEC319	6	Image processing	1	7.5	Optional
ENVS563	7	Geographic Data Science	1	15	Optional
Year 1 Semester 2 (CSAD)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP318	6	Ontologies and Semantic Web	2	15	Optional
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP530	7	MSc Group Project	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP559	7	Algorithmic Game Theory	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional
ENVS456	7	Web Mapping and Analysis	2	15	Optional
ELEC415	7	Information Theory and Coding	2	7.5	Optional

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Year 1 Semester 3 (CSAD)					
COMP702	7	MSc Project	Summer	60	Required

CSAD MSc Advanced Computer Science Part-time

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

From the set of taught modules available for full-time pathway students select modules totalling 120 credit points over period of minimum of two years and maximum of six years. The particular choice of modules over the years and semesters may be arbitrary provided the pre-requisites and conditions specified for full-time mode are satisfied. The further 60 credit points come from COMP702 (MSc Final Project) which is undertaken over the summer semester after all 120 credit points of taught modules are collected.

Note: for the part-time pathway the department cannot guarantee availability of modules for the whole duration of the programme. If a module becomes unavailable then it will be substituted by an alternative module in accordance with a modified programme specification or by approval of the appropriate Director of Studies.

Year 1 Semester 1 Part-time
Plus options totalling 15 to 30 credits from the optional modules provided pre-requisites are satisfied (60 credits needed for the year).
Unfortunately no timetabling availability can be guaranteed for the optional modules. Please note that ELEC415 and ELEC319 must be taken as a pair.

Year 1 Semester 2 Part-time
Plus options totalling 15 to 30 credits from the following modules provided pre-requisites are satisfied (60 credits needed for the year)
Unfortunately no timetabling availability can be guaranteed for the optional modules.
Please note that ELEC415 and ELEC319 must be taken as a pair.
No more than 30 credits of level 6 optional modules can be selected.

Year 2 Semester 1
Options totalling 30 credits from the following modules provided pre-requisites are satisfied (60 credits needed for the year).
Unfortunately no timetabling availability can be guaranteed for the optional modules.
Please note that ELEC415 and ELEC319 must be taken as a pair.

Year 2 Semester 2
Plus options totalling 30 credits from the following modules provided pre-requisites are satisfied (60 credits needed for the year).
Unfortunately no timetabling availability can be guaranteed for the following optional modules.
Please note that ELEC415 and ELEC319 must be taken as a pair.
No more than 30 credits of level 6 optional modules can be selected.

Year 2 Semester 3
COMP702 is the MSc 60 credit project module that will run over the summer from the week after the semester 2 exams to approximately one week before the start of the next academic year.

CSAD – MSc Advanced Computer Science Part Time					
Year 1 Semester 1 (CSAD p/t)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP516	7	Research Methods in Computer Science	1	15	Required
COMP521	7	Knowledge Representation	1	15	Optional

Module Code	Level	Module Title	Semester	Credit	Type
COMP557	7	Optimisation	1	15	Optional
ELEC319	7	Image processing	1	7.5	Optional
ENVS563	7	Geographic Data Science	1	15	Optional
Year 1 Semester 2 (CSAD p/t)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP318	6	Ontologies and Semantic Web	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP559	7	Algorithmic Game Theory	2	15	Optional
ENVS456	7	Web Mapping and Analysis	2	15	Optional
ELEC415	7	Information Theory and Coding	2	7.5	Optional

CSAD – MSc Advanced Computer Science Part Time					
Year 2 Semester 1 (CSAD p/t)					
Module Code	Level	Module Title	Semester	Credit	Type

Module Code	Level	Module Title	Semester	Credit	Type
COMP526	7	Efficient Algorithms	1	15	Optional
COMP528	7	Multi-core and Multi-Processor Programming	1	15	Optional
COMP557	7	Optimisation	1	15	Optional
ELEC319	7	Image processing	1	7.5	Optional
ENVS563	7	Geographic Data Science	1	15	Optional
Year 2 Semester 2 (CSAD p/t)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP318	6	Ontologies and Semantic Web	2	15	Optional
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP530	7	MSc Group Project	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP559	7	Algorithmic Game Theory	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional

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ENVS456	7	Web Mapping and Analysis	2	15	Optional
ELEC415	7	Information Theory and Coding	2	7.5	Optional
Year 2 Semester 3 (CSAD p/t)					
COMP702	7	MSc Project	Summer	60	Required

CSAI MSc Advanced Computer Science with a Year in Industry

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Note: for the part-time pathway the department cannot guarantee availability of modules for the whole duration of the programme. If a module becomes unavailable then it will be substituted by an alternative module in accordance with a modified programme specification or by approval of the appropriate Director of Studies.

The programme MSc in Advanced Computer Science with a Year in Industry is divided into two equally weighted yeas (years 1 and 2). The first year runs concurrently with the normal first and second undergraduate semesters, and comprises taught modules to a total of 60 credits per semester (120 credits in total). The placement takes place in the second year typically running concurrently with the normal first and second undergraduate semesters. This counts for a further 120 credits, making a total of 240 credits over the two year period.

At least 90 credits of the 120 taught credits available in the first two semesters must comprise level 'M' modules. The remaining 30 may include selected level 3 modules, taken from the Department's 3rd year module list, with the proviso that a graduates of the University of Liverpool cannot elect to take a level three module if they have already taken that module as part of their undergraduate study.

Semester 1
Options totalling 45 credits from the following modules provided pre-requisites are satisfied.
Please note that ELEC415 and ELEC319 must be taken as a pair.
No more than 30 credits of level 6 optional modules can be selected.
Each Year in Industry student must be registered for 120 credits in Year 1 and 120 credits in Year 2 (i.e. 240 credits in total).

Semester 2
Options totalling 60 credits from the following modules provided pre-requisites are satisfied.
Please note that ELEC415 and ELEC319 must be taken as a pair.
No more than 30 credits of level 6 optional modules can be selected.
Each Year in Industry student must be registered for 120 credits in Year 1 and 120 credits in Year 2 (i.e. 240 credits in total).

Year 2 Semesters 1 & 2
Preparation for the year in industry will begin in Year 1 through COMP516 "Research Methods in Computer Science" which is a 15 credit module. During the placement which is a 30-week minimum placement, the student should complete two-60 credit modules:
COMP598 MSc Placement Experience and
COMP599 MSc Industrial Project.

In order to receive the MSc degree, the student should pass both modules. COMP598 is a pass/fail module and will not contribute to the MSc degree classification and cannot be considered as a PG Dip exit award module since its emphasis is on gaining industrial experience. COMP599 is focused on doing an industrial research project and it will be chosen by the student by the end of semester 2 in Year One. In situations where a student is not able to find a placement by the end of semester 2, or fails to complete the industrial placement, the student will be able to transfer to the standard version of the programme and commence a new project at the University.

CSAI – MSc Advanced Computer Science with a Year in Industry					
Year 1 Semester 1 (CSAI)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP516	7	Research Methods in Computer Science	1	15	Required

COMP521	7	Knowledge Representation	1	15	Optional
COMP522	7	Privacy and Security	1	15	Optional
COMP526	7	Efficient Algorithms	1	15	Optional
COMP528	7	Multi-core and Multi-Processor Programming	1	15	Optional
COMP557	7	Optimisation	1	15	Optional
ELEC319	7	Image processing	1	7.5	Optional
ENVS563	7	Geographic Data Science	1	15	Optional
Year 1 Semester 2 (CSAI)					
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP318	6	Ontologies and Semantic Web	2	15	Optional
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP530	7	MSc Group Project	2	15	Optional

COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP559	7	Algorithmic Game Theory	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional
ENVS456	7	Web Mapping and Analysis	2	15	Optional
ELEC415	7	Information Theory and Coding	2	7.5	Optional
Year 2 Semester 1&2 (CSAI)					
COMP599	**7**	**MSc Industrial Project**	**1&2**	**60**	**Required**
COMP598	**7**	**MSc Placement Experience**	**1&2**	**60**	**Required**

TCSM MSc Theoretical Computer Science

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1
Options totalling 15 credits from the modules in the below table, provided pre-requistes are satisfied.
Only students who have not previously taken COMP323 (or an equivalent) as part of their undergraduate programme can take this module. Students who have taken COMP323 as part of their undergraduate programme take an additional optional module instead.

Year 2 Semester 2
Options totalling 30 credits from the following modules provided pre-requisites are satisfied.
No more than 30 credits of level 6 optional modules can be selected.
If COMP523 was not selected in Year 1 Semester 2 then 45 credits will need to be selected in Year 2 Semester 2.

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Year 1 Semester 3

COMP702 is the MSc 60 credit project module that will run over the summer from the week after the semester 2 exams to approximately one week before the start of the next academic year.

TCSM – MSc Theoretical Computer Science					
Year 1 Semester 1 (TCSM)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP516	7	**Research Methods in Computer Science**	1	15	**Required**
COMP323	6	**Introduction to Computational Game Theory**	1	15	**Required**
COMP557	7	**Optimisation**	1	15	**Required**
COMP521	*7*	*Knowledge Representation*	*1*	*15*	*Optional*
COMP526	*7*	*Efficient Algorithms*	*1*	*15*	*Optional*
ECON915	*7*	*Microeconomic Analysis*	*1*	*15*	*Optional*
Year 1 Semester 2 (TCSM)					
COMP559	7	**Algorithmic Game Theory**	2	15	**Required**
COMP555	*7*	*Advances in Theoretical Computer Science*	*2*	*15*	*Optional*
COMP523	*7*	*Advanced Algorithmic Techniques*	*2*	*15*	*Optional*
COMP310	*6*	*Multi-Agent Systems*	*2*	*15*	*Optional*

COMP315	*6*	*Cloud Computing for E-Commerce*	*2*	*15*	*Optional*
COMP524	*7*	*Safety and Dependability*	*2*	*15*	*Optional*
COMP527	*7*	*Data Mining and Visualisation*	*2*	*15*	*Optional*
COMP530	*7*	*MSc Group Project*	*2*	*15*	*Optional*
COMP575	*7*	*Computational Intelligence*	*2*	*15*	*Optional*
Year 1 Semester 3 (TCSM)					
COMP702	7	**MSc Project**	Summer	60	**Required**

TCSM MSc Theoretical Computer Science Part-Time

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1
Required 30 credits
Only students who have not previously taken COMP323 (or an equivalent) as part of their undergraduate programme can take this module. Students who have taken COMP323 as part of their undergraduate programme take an additional optional module instead.

Year 1 Semester 2
30 credits required

Year 2 Semester 1
Required 15 credits and options totalling 15 credits from the following modules provided pre-requisites are satisfied.

Year 2 Semester 2

No more than 30 credits of level 6 optional modules can be selected.
If COMP523 was not selected in Year 1 Semester 2 then 45 credits will need to be selected in Year 2 Semester 2.

Year 1 Semester 3
COMP702 is the MSc 60 credit project module that will run over the summer from the week after the semester 2 exams to approximately one week before the start of the next academic year.

TCSM – MSc Theoretical Computer Science Part Time					
Year 1 Semester 1 (TCSM p/t)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP323	6	Introduction to Computational Game Theory	1	15	Required
COMP557	7	Optimisation	1	15	Required
Year 1 Semester 2 (TCSM p/t)					
COMP559	7	Algorithmic Game Theory	2	15	Required
COMP523	7	Advanced Algorithmic Techniques	2	15	Required
Year 2 Semester 1 (TCSM p/t)					
COMP516	7	Research Methods in Computer Science	1	15	Required
COMP521	7	Knowledge Representation	1	15	Optional

COMP526	7	Efficient Algorithms	1	15	Optional
ECON915	7	Microeconomic Analysis	1	15	Optional
Year 2 Semester 2 (TCSM p/t)					
COMP555	7	Advances in Theoretical Computer Science	2	15	Optional
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP530	7	MSc Group Project	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional
Year 2 Semester 3 (TCSM p/t)					
COMP702	7	MSc Project	Summer	60	Required

In order to receive the MSc degree, the student should pass both modules. COMP598 is a pass/fail module and will not contribute to the MSc degree classification and cannot be considered as a PG Dip exit award module since its emphasis is on gaining industrial experience. COMP599 is focused on doing an industrial research project and it will be chosen by the student by the end of semester 2 in Year One. In situations where a student is not able to find a placement by the end of semester 2, or fails to complete the industrial placement, the student will be able to transfer to the standard version of the programme and commence a new project at the University.

TCSI MSc Theoretical Computer Science with a Year in Industry

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

Year 1 Semester 1

The programme MSc Theoretical Computer Science with a Year in Industry is divided into two equally weighted yeas (years 1 and 2). The first year runs concurrently with the normal first and second undergraduate semesters, and comprises taught modules to a total of 60 credits per semester (120 credits in total). The placement takes place in the second year typically running concurrently with the normal first and second undergraduate semesters. This counts for a further 120 credits, making a total of 240 credits over the two year period.

Only students who have not previously taken COMP323 (or an equivalent) as part of their undergraduate programme can take this module.
Students who have taken COMP323 (or an equivalent) as part of their undergraduate programme take COMP523.

Year 2 Semesters 1 & 2

Preparation for the year in industry will begin in Year 1 through COMP516 "Research Methods in Computer Science" which is a 15 credit module. During the placement which is a 30-week minimum placement, the student should complete two-60 credit modules:
COMP598 MSc Placement Experience and
COMP599 MSc Industrial Project.

TCSM – MSc Theoretical Computer Science with a Year in Industry					
Year 1 Semester 1 (TCSI)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP516	7	Research Methods in Computer Science	1	15	Required
COMP323	6	Introduction to Computational Game Theory	1	15	Required
COMP557	7	Optimisation	1	15	Required
COMP521	7	Knowledge Representation	1	15	Optional
COMP526	7	Efficient Algorithms	1	15	Optional
ECON915	7	Microeconomic Analysis	1	15	Optional

Year 1 Semester 2 (TCSI)					
COMP559	7	Algorithmic Game Theory	2	15	Required

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COMP555	7	Advances in Theoretical Computer Science	2	15	Optional
COMP523	7	Advanced Algorithmic Techniques	2	15	Optional
COMP310	6	Multi-Agent Systems	2	15	Optional
COMP315	6	Cloud Computing for E-Commerce	2	15	Optional
COMP524	7	Safety and Dependability	2	15	Optional
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP530	7	MSc Group Project	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional
Year 2 Semester 1&2 (TCSI)					
COMP599	**7**	**MSc Industrial Project**	**1&2**	**60**	**Required**
COMP598	**7**	**MSc Placement Experience**	**1&2**	**60**	**Required**

CMBD MSc Big Data and High Performance Computing

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

The programme is divided into three, equally weighted semesters. The first two, which are run concurrently with the normal undergraduate semesters, comprise taught modules to a total of 60 credits per semester. An extended research based project, culminating in a dissertation, is undertaken full time over the summer period. This counts for a further 60 credits, making a total of 180.

Semester 1
Options totalling 15 credits from the following semester 1 modules.

Semester 2
Options totalling 30 credits from the following semester 2 modules.

Year 1 Semester 3
COMP702 is the MSc 60 credit project module that will run over the summer from the week after the semester 2 exams to approximately one week before the start of the next academic year.

CMBD – MSc Big Data and High Performance Computing					
Year 1 Semester 1 (CMBD)					
Module Code	Level	Module Title	Semester	Credit	Type

COMP516	7	Research Methods in Computer Science	1	15	Required
COMP528	7	Multi-Core and Multi-Processor Programming	1	15	Required
COMP529	7	Big Data Analytics	1	15	Required
COMP526	7	Applied Algorithmics	1	15	Optional
COMP557	7	Optimisation	1	15	Optional
Year 1 Semester 2 (CMBD)					
COMP527	7	Data Mining and Visualisation	2	15	Required
COMP530	7	MSc Group Project	2	15	Required
COMP524	7	Safety and Dependability	2	15	Optional
COMP559	7	Algorithmic Game Theory	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional
Year 1 Semester 3 (CMBD)					
COMP702	7	MSc Project	Summer	60	Required

CMBD MSc Big Data and High Performance Computing Part-Time

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

The programme is divided into three, equally weighted semesters. The first two, which are run concurrently with the normal undergraduate semesters, comprise taught modules to a total of 60 credits per semester. An extended research based project, culminating in a dissertation, is undertaken full time over the summer period. This counts for a further 60 credits, making a total of 180.

Semester 1
Required 15 credits and options totalling 15 credits from the following semester 1 modules.

Semester 2
Required 30 credits from the following semester 2 modules.

Year 1 Semester 3
COMP702 is the MSc 60 credit project module that will run over the summer from the week after the semester 2 exams to approximately one week before the start of the next academic year.

CMBD – MSc Big Data and High Performance Computing Part Time
Year 1 Semester 1 (CMBD)

Module Code	Level	Module Title	Semester	Credit	Type
COMP528	**7**	**Multi-Core and Multi-Processor Programming**	**1**	**15**	**Required**
COMP526	*7*	*Applied Algorithmics*	*1*	*15*	*Optional*
COMP557	*7*	*Optimisation*	*1*	*15*	*Optional*

Year 1 Semester 2 (CMBD)					
COMP524	7	Safety and Dependability	2	15	Optional
COMP559	7	Algorithmic Game Theory	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional
Year 2 Semester 1 (CMBD)					
COMP516	7	Research Methods in Computer Science	1	15	Required
COMP529	7	Big Data Analytics	1	15	Required
Year 2 Semester 2 (CMBD)					
COMP527	7	Data Mining and Visualisation	2	15	Required
COMP530	7	MSc Group Project	2	15	Required
Year 2 Semester 3 (CMBD)					
COMP702	7	MSc Project	Summer	60	Required

CMBI MSc Big Data and High Performance Computing with a Year in Industry

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

The programme is divided into two equally weighted yeas (years 1 and 2). The first year runs concurrently with the normal first and second undergraduate semesters, and comprises taught modules to a total of 60 credits per semester (120 credits in total). The placement takes place in the second year typically running concurrently with the normal first and second undergraduate semesters. This counts for a further 120 credits, making a total of 240 credits over the two year period.

Semester 1
Options totalling 15 credits from the following semester 1 modules.
Each student on this programme should be registered for 180 credits for the academic year.

Semester 2
Options totalling 30 credits from the following semester 2 modules.
Each student on this programme should be registered for 180 credits for the academic year.

Year 2 Semesters 1 & 2
Preparation for the year in industry will begin in Year 1 through COMP516 "Research Methods in Computer Science" which is a 15 credit module.

During the placement which is a 30-week minimum placement, the student should complete two-60 credit modules:
COMP598 MSc Placement Experience and
COMP599 MSc Industrial Project.

In order to receive the MSc degree, the student should pass both modules. COMP598 is a pass/fail module and will not contribute to the MSc degree classification and cannot be considered as a PG Dip exit award module since its emphasis is on gaining industrial experience. COMP599 is focused on doing an industrial research project and it will be chosen by the student by the end of semester 2 in Year One. In situations where a student is not able to find a placement by the end of semester 2, or fails to complete the industrial placement, the student will be able to transfer to the standard version of the programme and commence a new project at the University.

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CMBI – MSc Big Data and High Performance Computing with a Year in Industry					
Year 1 Semester 1 (CMBI)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP516	7	Research Methods in Computer Science	1	15	Required
COMP528	7	Multi-Core and Multi-Processor Programming	1	15	Required
COMP529	7	Big Data Analytics	1	15	Required
COMP526	7	Applied Algorithmics	1	15	Optional
COMP557	7	Optimisation	1	15	Optional
Year 1 Semester 2 (CMBI)					
COMP527	7	Data Mining and Visualisation	2	15	Required
COMP530	7	MSc Group Project	2	15	Required
COMP524	7	Safety and Dependability	2	15	Optional
COMP559	7	Algorithmic Game Theory	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional
Year 2 Semester 1&2 (CMBI)					
COMP599	7	MSc Industrial Project	1&2	60	Required
COMP598	7	MSc Placement Experience	1&2	60	Required

CDSM MSc Data Science and Artificial Intelligence

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

The programme is divided into three, equally weighted semesters. The first two, which are run concurrently with the normal undergraduate semesters, comprise taught modules to a total of 60 credits per semester. An extended research based project, culminating in a dissertation, is undertaken full time over the summer period. This counts for a further 60 credits, making a total of 180.

 Note 1:
In exceptional circumstances and with the approval of the programme Director of Studies, alternative modules may be substituted for optional and required modules, except COMP516

Note 2: Computer Science students can take COMM754 without the pre-requisite COMM752, subject to approval by the Programme Director

Semester 1 optional modules
Choose one module from the following, based on individual preference

Semester 2 optional modules
Choose three modules from the following, based on individual preference

CDSM – MSc Data Science and Artificial Intelligence					
Year 1 Semester 1 (CDSM)					
Module Code	Level	Module Title	Semester	Credit	Type
COMP516	7	Research Methods in Computer Science	1	15	Required

COMP517	7	Programming Fundamentals	1	15	Required
COMP533	7	Maths and Statistics fr AI and Data Science	1	15	Required
COMP518	7	Database and Information Systems	1	15	Optional
COMM752	7	Big Data and Society: Foundations, Politics and Policy B	1	15	Optional
Year 1 Semester 2 (CDSM)					
COMP534	7	Applied Artificial Intelligence	2	15	Required
COMP527	7	Data Mining and Visualisation	2	15	Optional
COMP519	7	Web Programming	2	15	Optional
COMP530	7	MSc Group Project	2	15	Optional
COMP532	7	Machine Learning and BioInspired Optimisation	2	15	Optional
COMP575	7	Computational Intelligence	2	15	Optional
COMM718	7	Artificial Intelligence and Communication B	2	15	Optional
COMM754	7	Big Data and Society: Algorithms and Platforms B	2	15	Optional
Year 1 Semester 3 (CDSM)					
COMP702	7	MSc Project	Summer	60	Required

CZSM MSc Data Science and Artificial Intelligence with a Year in Industry

Students must ensure that they have checked the pre-requisite and co-requisite information for Computer Science modules when considering which optional modules to select. Please see Section 2.

The programme MSc in Advanced Computer Science with a Year in Industry is divided into two equally weighted years (years 1 and 2). The first year runs concurrently with the normal first and second undergraduate semesters, and comprises taught modules to a total of 60 credits per semester (120 credits in total). The placement takes place in the second year typically running concurrently with the normal first and second undergraduate semesters. This counts for a further 120 credits, making a total of 240 credits over the two year period.

Note1: In exceptional circumstances and with the approval of the programme Director of Studies, alternative modules may be substituted for optional and required modules, except COMP516.

Note 2: Computer Science students can take COMM754 without the pre-requisite COMM752, subject to approval by the Programme Director

Students can be transferred to the version of this programme w/o the year in industry (MSc Data Science and Artificial Intelligence), which has PGDip, PGCert, and PG Award options.

Semester 1
Choose one module from the following, based on individual preference

Semester 2
Choose three modules from the following, based on individual preference

Year 2 Semesters 1 & 2
Preparation for the year in industry will begin in Year 1 through COMP516 "Research Methods in Computer Science" which is a 15 credit module.

During the placement which is a 30-week minimum placement, the student should complete two-60 credit modules:
COMP598 MSc Placement Experience and
COMP599 MSc Industrial Project.

In order to receive the MSc degree, the student should pass both modules. COMP598 is a pass/fail module and will not contribute to the MSc degree classification and cannot be considered as a PG Dip exit award module since its emphasis is on gaining industrial experience. COMP599 is focused on doing an industrial research project and it will be chosen by the student by the end of semester 2 in Year One. In situations where a student is not able to find a placement by the end of semester 2, or fails to complete the industrial placement, the student will be able to transfer to the standard version of the programme and commence a new project at the University.

CZSM – MSc Data Science and Artificial Intelligence with a Year in Industry					
Year 1 Semester 1 (CZSM)					
Module Code	**Level**	**Module Title**	**Semester**	**Credit**	**Type**
COMP516	7	Research Methods in Computer Science	1	15	Required
COMP517	7	Programming Fundamentals	1	15	Required
COMP533	7	Maths and Statistics fr AI and Data Science	1	15	Required
COMP518	*7*	*Database and Information Systems*	*1*	*15*	*Optional*
COMM752	*7*	*Big Data and Society: Foundations, Politics and Policy B*	*1*	*15*	*Optional*
Year 1 Semester 2 (CZSM)					
COMP534	7	Applied Artificial Intelligence	2	15	Required
COMP527	7	Data Mining and Visualisation	2	15	*Optional*
COMP519	*7*	*Web Programming*	*2*	*15*	*Optional*

COMP530	*7*	*MSc Group Project*	*2*	*15*	*Optional*
COMP532	*7*	*Machine Learning and BioInspired Optimisation*	*2*	*15*	*Optional*
COMP575	*7*	*Computational Intelligence*	*2*	*15*	*Optional*
COMM718	*7*	*Artificial Intelligence and Communication B*	*2*	*15*	*Optional*
COMM754	*7*	*Big Data and Society: Algorithms and Platforms B*	*2*	*15*	*Optional*
Year 2 Semester 1&2 (CZSM)					
COMP599	**7**	**MSc Industrial Project**	**1&2**	**60**	**Required**
COMP598	**7**	**MSc Placement Experience**	**1&2**	**60**	**Required**

2. Information on Modules

Optional Module Registration for Undergraduate Students - Capped Modules

Mandatory and optional modules

Students do not need to take any action in relation to **required and mandatory modules** for the 2023-24 academic year – these will be automatically pre-registered for students, who will be able to view the details within the University's Module Registration Portal when it is open between Tuesday, 02 May 2023 and Tuesday, 09 May 2023.

At undergraduate level students need to complete 120 credits of modules in each year. That usually means that in Semester 1 students will take 60 credits and in Semester 2 students will take a further 60 credits. If a programme contains a 30-credit year-long module(s), the remainder of a student's credits should split equally.

Making choices and understanding modules with capped numbers

In response to student feedback and following consultation with recent Guild Officers, many module caps have now been lifted to allow more students to secure their preferred options.

There are, however, a small number of modules within the Department of Computer Science where caps remain as a result of limits on staff capacity or constraints such as requirement for specific teaching space, field station capacity and equipment. These are:

- COMP228 – App Development (123 spaces)
- COMP335 – Communicating Computer Science – Students will not be able to select this module via the registration process. Students will need to undergo an interview with the Module Co-ordinator before being selected. To apply for this module students will need to email the Module Co-ordinator, Dr Sebastian Wild (Sebastian.Wild@liverpool.ac.uk), with a personal statement indicating why they would be suitable for this module. The deadline to do so is 11 June 2023.

In many cases, even if there is a cap on the module a student may well be able to obtain a place on the module. However, if a student is interested in taking one or more modules with caps, the Department would encourage a student to consider their preferences before commencing the module registration process. Then if any of their preferred modules are full a student can make use of the functionality within the module registration portal to indicate reserve choices and rank all of their selections – both secured and reserve – in order of preference. This will allow a student's intentions to be logged in the event that capped modules reach capacity, and

may be used by the Department / School should any spaces become available after module registration has closed.

If the Computer Science Programme Structure indicates that there are modules which are owned by other Departments / Schools, there may also be caps in place and this is outside of the control of the Department of Computer Science.

Pre-requisite and Co-requisite Information for CS Modules

The following information should be referred to when selecting optional modules.

Module Code	Pre-requisites #1	Pre-requisites #2	Pre-requisites #3	Co-requisites #1	Co-requisites #2
COMP101					
COMP105					
COMP107					
COMP108					
COMP109					
COMP111					
COMP116					
COMP122					
COMP124					
COMP201	COMP122				
COMP202	COMP108	COMP116			
COMP207	COMP122				
COMP208	COMP207	COMP201	COMP122		
COMP211	COMP122				
COMP212	COMP108	COMP122			
COMP218	COMP108				
COMP219	COMP111	COMP116	COMP122		
COMP220	COMP201	COMP122			

Module Code	Pre-requisites #1	Pre-requisites #2	Pre-requisites #3	Co-requisites #1	Co-requisites #2
COMP221	COMP107				
COMP222	COMP122	COMP111			
COMP226	COMP116				
COMP228	COMP122				
COMP229	COMP116	COMP109			
COMP232	COMP211				
COMP281					
COMP282	COMP281				
COMP283	COMP207				
COMP284	COMP207	COMP107	COMP122		
COMP285	COMP201	COMP122			
COMP299					
COMP304	COMP111	COMP109			
COMP305	COMP116	COMP219			
COMP309	COMP202				
COMP310	COMP111				
COMP313	COMP109	COMP111			
COMP315					
COMP318	COMP111				
COMP319	COMP201				
COMP323	COMP116				
COMP324	COMP108	COMP116	COMP202		
COMP326	COMP323				
COMP328	COMP122	COMP201	COMP281		
COMP329	COMP111	COMP116			
COMP331	COMP116				
COMP335					
COMP336	COMP122				

Module Code	Pre-requisites #1	Pre-requisites #2	Pre-requisites #3	Co-requisites #1	Co-requisites #2
COMP337	COMP116				
COMP338	COMP116	COMP122			
COMP341					
COMP342	COMP222				
COMP343	COMP124				
COMP390					
COMP391					
COMP392					
COMP396	COMP226				
COMP516					
COMP517					
COMP518					
COMP519	COMP517	COMP518			
COMP521					
COMP522					
COMP523					
COMP524					
COMP525					
COMP526					
COMP527	COMP516				
COMP528					
COMP529					
COMP530	COMP516				
COMP532	COMP517				
COMP533	COMP516	COMP517			
COMP534					
COMP557					
COMP559	COMP323				
COMP575					
COMP590	COMP516				
COMP591					

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Module Code	Pre-requisites #1	Pre-requisites #2	Pre-requisites #3	Co-requisites #1	Co-requisites #2
COMP592					
COMP598	COMP516			–	
COMP599					
COMP702	COMP516				

Pre-requisite and Co-requisite Information for Modules on Computer Science Programmes, where CS is not the Module Home Department

The following information should be referred to when selecting optional modules.

Key for module home departments:

Department of Communication and Media
Management School
School of Environmental Sciences
Department of Mathematical Sciences

Module Code	Pre-requisites #1	Pre-requisites #2	Pre-requisites #3	Co-requisites #1	Co-requisites #2
ACFI101					
ACFI102					
ACFI103					
ACFI201	ACFI101			ACFI210	
ACFI202	ACFI201				
ACFI213	ACFI103				
ACFI302	ACFI201	ACFI309	ACFI101		
ACFI304	ACFI204				
ACFI309	ACFI201	ACFI101			
ACFI342	ACFI304				
COMM718					
COMM754					
EBUS301	ULMS101	ULMS151			
ECON121					

Module Code	Pre-requisites #1	Pre-requisites #2	Pre-requisites #3	Co-requisites #1	Co-requisites #2
ECON241	ACFI103	ECON123	ECON121		
ECON915					
ENVS456					
ENVS563					
MATH101					
MATH102					
MATH103					
MATH122					
MATH142					
MATH163					
MATH221	MATH101	MATH102	MATH103		
MATH225					
MATH226	MATH101	MATH102	MATH103		
MATH228	MATH101	MATH102	MATH103	MATH122	
MATH242	MATH101	MATH102	MATH103		
MATH243					
MATH244					
MATH247	MATH101	MATH102	MATH103		
MATH253	MATH101	MATH102	MATH163		
MATH254					
MATH260	MATH101	MATH102	MATH103	MATH162	
MATH268					
MATH269	MATH101	MATH102	MATH103		
MATH323	MATH101	MATH102	MATH103	MATH224	
MATH324	MATH101	MATH102	MATH103		
MATH325	MATH101	MATH102	MATH103	MATH122	
MATH326	MATH101	MATH102	MATH228	MATH103	MATH122
MATH331					
MATH342					
MATH343					

MATH344	MATH101	MATH102	MATH103		
MATH349	MATH101	MATH102	MATH103		
MATH361	MATH263	MATH264			
MATH362	MATH101	MATH103	MATH162	MATH264	
MATH363	MATH101	MATH102	MATH103	MATH162	MATH263
MATH364					
MATH366	MATH101	MATH103	MATH162	MATH264	
MATH367					
MATH399					
MKIB225	ULMS101	MKIB153	MKIB152		
MKIB351	MKIB225	MKIB253			

Computer Science Module List

The Department has prepared the following collection of videos to provide an overview of Computer Science modules:

2023-24 Year 1 Module Videos: https://canvas.liverpool.ac.uk/courses/62776/pages/module-information-year-1-teaser-videos-for-2023-24

2023-24 Year 2 Module Videos: https://canvas.liverpool.ac.uk/courses/62776/pages/module-information-year-2-teaser-videos-for-2023-24

2023-24 Year 3 Module Videos: https://canvas.liverpool.ac.uk/courses/62776/pages/module-information-year-3-teaser-videos-for-2023-24

2023-24 MSc / PGT Module Videos: https://canvas.liverpool.ac.uk/courses/62776/pages/module-information-msc-level-teaser-videos-for-2023-24

Module Code	Module Name	Semester	Credits	Module Co-ordinator	Notes for 2023/24
COMP101	Introduction to Programming	1	15	Mr Keith Dures	
COMP105	Programming Language Paradigms	1	15	Dr John Fearnley	
COMP107	Designing Systems for the Digital Society	1	15	Dr Floriana Grasso	
COMP108	Data Structures and Algorithms	2	15	Prof Prudence Wong	
COMP109	Foundations of Computer Science	1	15	Prof Boris Konev	
COMP111	Introduction to Artificial Intelligence	1	15	Prof Frank Wolter	
COMP116	Analytic Techniques for Computer Science	2	15	Prof Paul Dunne	
COMP122	Object-Oriented Programming	2	15	Dr Patrick Totzke	
COMP124	Computer Systems	2	15	Dr Stuart Thomason	
COMP201	Software Engineering I	1	15	Mr Sebastian Coope	
COMP202	Complexity of Algorithms	2	15	TBC	
COMP207	Database Development	1	15	Dr Rasmus Ibsen-Jensen	
COMP208	Group Project	2	15	Dr Michele Zito	
COMP211	Computer Networks	1	15	Prof Martin Gairing	
COMP212	Distributed Systems	2	15	Dr Othon Michail	
COMP218	Introduction to Theory of Computation	1	15	Dr Dominik Wojtczak	
COMP219	Advanced Artificial Intelligence	1	15	Dr Xiaowei Huang	
COMP220	Software Development Tools	2	15	Mr Sebastian Coope	
COMP221	Planning your Career	1	7.5	Dr Tony Tan	
COMP222	Principles of Computer Games Design and Implementation	2	15	Dr Anthony McCAbe	
COMP226	Computer-Based Trading in Financial Markets	2	15	Dr Vladimir Gusev	

COMP228	App Development	1	15	Mr Phil Jimmieson	
COMP229	Introduction to Data Science	1	15	Dr Olga Anosova	
COMP232	Cyber Security	2	15	Dr Jeffrey Ray	
COMP281	Principles of C and Memory Management	2	7.5	Mr Phil Jimmieson	
COMP282	The C++ Programming Language	2	7.5	Dr Rasmus Ibsen-Jensen	
COMP283	Applied Database Management	2	7.5		not offered this year
COMP284	Scripting Languages	2	7.5	Dr Ullrich Hustadt	
COMP285	Computer Aided Software Development	2	7.5	Mr Sebastian Coope	
COMP299	Industrial Placement Year 3	1 & 2	15	Dr Rasmus Ibsen-Jensen	
COMP304	Knowledge Representation and Reasoning	1	15	Dr Louwe Kuijer	Jointly taught with COMP521
COMP305	Biocomputation	1	15	Dr Chao Huang	
COMP309	Efficient Sequential Algorithms	1	15	Prof Igor Potapov	
COMP310	Multi-Agent Systems	2	15	Dr Bei Peng	
COMP313	Formal Methods	2	15	Dr Qiyi Tang	
COMP315	Cloud Computing for E-Commerce	2	15	Dr Dominic Richards (STFC) Dr Louwe Kuijer	
COMP318	Ontologies and semantic web	2	15	Dr Valentina Tamma	
COMP319	Software Engineering II	1	15	Mr Sebastian Coope	
COMP323	Introduction to Computational Game Theory	1	15	Prof Paul Spirakis	
COMP324	Complex Information Networks	2	15	Dr Michele Zito	

COMP326	Computational Game Theory and Mechanism Design	2	15	Dr Georgios Birmpas	Jointly taught with COMP559
COMP328	High Performance Computing	2	15	Mr Henry Forbes and Dr Joshua Alcock	
COMP329	Autonomous Mobile Robotics	1	15	Dr Terry Payne	
COMP331	Optimisation	1	15	Dr Friedrich Slivovsky	Jointly taught with COMP557
COMP335	Communicating Computer Science	1 & 2	15	Dr Nikhil Mande	
COMP336	Big Data Analysis	1	15	Dr Dominik Wojtczak and Vasil Alexandrov	Jointly taught with COMP529
COMP337	Data Mining and Visualisation	2	15	Dr Procheta Sen	Jointly taught with COMP527
COMP338	Computer Vision	1	15	Dr Guangliang Cheng	
COMP341	Robot Perception and Manipulation	2	15	Dr Anh Nguyen	
COMP342	Advanced Topics in Computer Game Deveopment	2	15	Dr Konstantinos Tsakalidis	
COMP343	Computer Forensics	2	15	Dr Jeffrey Ray	
COMP390	Honours Year Computer Science Project	1 & 2	30	Dr Stuart Thomason	
COMP391	Final Year First Semester 15 Credit Project	1	15	Prof Rida Laraki	not offered this year
COMP392	Final Year Second Semester 15 Credit Project	2	15	Prof Rida Laraki	

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COMP396	Honours Year Automated Trading Group Project	1 & 2	30	Dr John Fearnley	
COMP516	Research Methods in Computer Science	1	15	Dr Mario Gianni	
COMP517	Programming Fundamentals	1	15	Dr David Purser	
COMP518	Database and Information Systems	1	15	Dr Maya Wardeh	
COMP519	Web Programming	2	15	Dr Ullrich Hustadt	
COMP521	Knowledge Representation	1	15	Dr Louwe Kuijer	Jointly taught with COMP304
COMP522	Privacy and Security	1	15	Dr Alexei Lisitsa	
COMP523	Advanced Algorithmic Techniques	2	15	Dr Meng Fang	
COMP524	Safety and Dependability	2	15	Prof Sven Schewe	
COMP525	Reasoning about Action and Change	2	15		not offered this year
COMP526	Efficient Algorithmics	1	15	Dr Sebastian Wild	
COMP527	Data Mining and Visualisation	2	15	Dr Procheta Sen	Jointly taught with COMP337
COMP528	Multi-core and Multi-Processor Programming	1	15	Dr Joshua Alcok and Mr Henry Forbes	
COMP529	Big Data Analytics	1	15	Dr Dominik Wojtczak and Vasil Alexandrov	Jointly taught with COMP336
COMP530	MSc Group Project	2	15	Dr Viktor Zamaraev	
COMP532	Machine Learning and BioInspired Optimisation	2	15	Dr Meng Fang	
COMP533	Maths and Statistics for AI and Data Science	1	15	Prof Leszek Gasieniec	
COMP534	Applied Artificial Intelligence	2	15	TBC	
COMP555	Adcances in Theoretical Computer Science	2	15	Dr Sebastian Wild	

COMP557	Optimisation	1	15	Dr Friedrich Slivovsky	Jointly taught with COMP331
COMP559	Algorithmic Game Theory	2	15	Dr Georgios Bimpas	Jointly taught with COMP326
COMP575	Computational Intelligence	2	15	Dr Tulika Saha	
COMP590	MEng Final Year Project	2	60	Prof Rida Laraki	
COMP591	MEng Group Project	1	30	Prof Rida Laraki	
COMP592	MEng Individual Project	2	30	Prof Rida Laraki	
COMP598	MSc Placement Experience	1 & 2	60	Prof Igor Potapov	
COMP599	MSc Industrial Project	1 & 2	60	Prof Igor Potapov	
COMP702	MSc Project	Summer	60	Prof Paul Dunne	

Assessment and Resit arrangement information for CS Modules

The following information has been taken from the Module Specifications and is intended to provide students with an overview of arrangements for each module. Further information about the modules listed below is available at
https://www.liverpool.ac.uk/study/subjects/computer-science/

Any problems relating to or affecting your studies (for example Exemption from Late Penalties) on modules owed by the CS, should be forwarded to the CS Student Experience Team:
csstudy@liverpool.ac.uk

Module Code	Assessment Strategy
COMP101	University assessment ID / Departmental assessment ID / Weighting: 101 / CA7 / 18% 101.1 / CA5 / 16% 101.2 / CA6 / 16% 101.3 / CA4 / 13% 101.4 / CA3 / 13% 101.5 / CA1 / 12% 101.6 / CA2 / 12% Anonymous marking is impossible. Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, Lab based resit exam will replace CA components, the Learning Outcomes will be covered in the resit exam.
COMP105	University assessment ID / Departmental assessment ID / Weighting: 105 / CA3 / 25% 105.1 / Class Test 1 / 25% 105.2 / CA1 / 25% 105.3 / CA2 / 25% Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / Lab

sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work.

Reassessment opportunity: Yes, Lab based resit exam will replace CA components, the Learning Outcomes will be covered in the resit exam.

COMP107	University assessment ID / Departmental assessment ID / Weighting: 107 / CA4 / 25% 107.1 / CA3 / 25% 107.2 / CA1 / 25% 107.3 / CA2 / 25% CA1: The students will work in a group to the production of a document aimed at evaluating the adoption of an information system in a given context. Students will research competitor products, will analyse the impact of the potential new system uptake, and will present arguments in favour and against such uptake. CA2: Students will work in a group to the production of a design of a database as a proof of concept of the system identified in Assignment 1, using Entity Relationship modelling. CA3: Students will work in groups towards a presentation introducing the proof of concept, pitching to a potential customer, paying special attention to ethical implications of their solution. Students will peer assess other groups presentations. CA4: Students will engage in a number of individual tasks towards setting up their personal e-portfolio. These will include collecting their experience on all assessments, participating to mock interviews and career advising sessions, and/or various activities organised by guest speakers. Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, CA resit opportunity available. Each

	resit assessment task will be different from the original assessment, except in the case of a skills–based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co–ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the task.
COMP108	University assessment ID / Departmental assessment ID / Weighting: 108 / Exam / 60% 108.1 / CA1 / 15% 108.2 / CA2 / 15% 108.3 / CA3 / 10% CA: 3 (sets of) assessment tasks. This work is not marked anonymously. Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. The Learning Outcomes will be demonstrated on appropriately selected examples in the assessments, therefore all of the assessments address the specified Learning Outcomes. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP109	University assessment ID / Departmental assessment ID / Weighting: 109 / Exam / 70% 109.1 / CA1 / 10% 109.2 / CA2 / 10% 109.3 / CA3 / 10% This CA work is not marked anonymously. Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab

	sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP111	University assessment ID / Departmental assessment ID / Weighting: 111 / Exam / 70% 111.1 / CA1 / 10% 111.2 / CA2 / 10% 111.3 / CA3 / 10% Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP116	University assessment ID / Departmental assessment ID / Weighting: 116 / Exam / 60% 116.1 / CA3 / 15% 116.2 / CA2 / 15% 116.3 / CA1 / 10% CA: Three class tests Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP122	University assessment ID / Departmental assessment ID / Weighting: 122 / Class Test 1 / 15% 122.1 / CA3 / 25% 122.2 / CA2 / 25%

	122.3 / CA1 / 15% 122.4/ CA4 / 10% Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, Lab based resit exam will replace CA components, the Learning Outcomes will be covered in the resit exam.
COMP124	University assessment ID / Departmental assessment ID / Weighting: 124 / Final Exam / 50% 124.1 / CA2 (Class Test) / 30% 124.2 / CA1 (Programming Assignment) / 20% Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, resit exam will replace failed CA components. All Learning Outcomes will be covered in the resit exam.
COMP201	University assessment ID / Departmental assessment ID / Weighting: 201 / Exam / 60% 201.1 / CA1 / 20% 201.2 / CA2 / 20% This CA work is not marked anonymously. Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.

COMP202	University assessment ID / Departmental assessment ID / Weighting: 202 / Exam / 70% 202.1 / CA1 / 15% 202.2 / CA2 / 15% CA1: Class test CA2: Assignment Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP207	University assessment ID / Departmental assessment ID / Weighting: 207 / Exam / 65% 207.1 / CA1 / 20% 207.2 / CA2 / 15% This CA work is not marked anonymously. Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP208	University assessment ID / Departmental assessment ID / Weighting: 208 / CA5 / 50% 208.1 / CA1 / 15% 208.2 / CA4 / 15% 208.3 / CA2 / 12% 208.4 / CA3 / 8% CA1: Design CA2: Requirements Analysis CA3: Meeting Record CA4: Software Demonstration CA5: Portfolio and Individual Contribution. The Portfolio itself is worth 30%; the peer assessment exercise is worth 20%.

	Reassessment opportunity: Yes resit of failed CA components.
COMP211	University assessment ID / Departmental assessment ID / Weighting: 211 / Exam / 70% 211.1 / CA1 / 10% 211.2 / CA2 / 10% 211.3 / CA3 / 10% CA: 2 (sets of) assessment tasks. This work is not marked anonymously. Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP212	University assessment ID / Departmental assessment ID / Weighting: 212 / Exam / 70% 212.1 / CA2 / 15% 212.2 / CA1 / 15% CA: 2 (sets of) assessment tasks. This work is not marked anonymously. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP218	University assessment ID / Departmental assessment ID / Weighting: 218 / Exam / 70% 218.1 / CA1 / 10% 218.2 / CA2 / 10% 218.3 / CA3 / 10% CA: two class tests contributing 10% each (CA1 & CA2). Online exercises worth 10% (CA3). This work is marked anonymously. Failure in any component of this module may be compensated for by higher marks in other components of the module.

	Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP219	University assessment ID / Departmental assessment ID / Weighting: 219 / Exam / 70% 219.1 / CA1 / 15% 219.2 / CA2 / 15% CA1: Simple Machine Learning (week 6). This work is marked anonymously. CA2: Train Deep Learning Agents (week 12). This work is marked anonymously. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP220	University assessment ID / Departmental assessment ID / Weighting: 220 / Exam / 80% 220.1 / CA1 / 10% 220.2 / CA2 / 10% CA1: Class test CA2: Lab based assessment The CA work is not marked anonymously. Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP221	University assessment ID / Departmental assessment ID / Weighting: 221 / CA1 / 100% If a student fails to pass the module at the first sitting, students on the Year in Industry programmes will be transferred to the equivalent programme without the placement year.

	Resit Opportunity Available? Yes, CA resit opportunity available. The resit assessment task will be a reflective portfolio different from the original assessment. The deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period.
COMP222	University assessment ID / Departmental assessment ID / Weighting: 222 / Exam / 70% 222.1 / CA1 / 12% 222.2 / CA2 / 12% 222.3 / CA3 / 6% CA: 3 (sets of) assessment tasks. This work is not marked anonymously. Practical assessment is employed for both formative assessment and summative assessment. Students will get short formative feedback on a weekly basis from the module demonstrators during tutorial / lab sessions. More detailed summative and formative feedback will be returned following assessment of the continuously assessed (CA) work. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP226	University assessment ID / Departmental assessment ID / Weighting: 226 / Exam / 80% 226.1 / CA1 / 10% 226.2 / CA2 / 10% Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP228	University assessment ID / Departmental assessment ID / Weighting: 228 / Exam / 60% 228.1 / CA1 / 15% 228.2 / CA2 / 15% 228.3 / CA3 / 10% CA: Three (sets of) assessment tasks.

	Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP229	University assessment ID / Departmental assessment ID / Weighting: 229 / Exam / 70% 229.1 / CA1 / 30% 4-5 formative assessments (marked by demonstrators) – using problems similar to exam questions, without a contribution to the final mark. Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP232	University assessment ID / Departmental assessment ID / Weighting: 232 / Exam / 60% 232.1 / CA3 / 20% 232.2 / CA1 / 10% 232.3 / CA2 / 10% Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP281	University assessment ID / Departmental assessment ID / Weighting: 281 / CA2 / 50% 281.1 / CA1 / 50% CA: Two (sets of) assessment tasks. Reassessment opportunity: Yes, each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall on the Friday prior to the start of the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the task.
COMP282	University assessment ID / Departmental assessment ID / Weighting: 282 / CA2 / 50% 282.1 / CA1 / 50%

	Reassessment opportunity: Yes, a single problem sheet to be solved in a three hour session in the departmental lab replaces all assessment tasks. Students are allowed internet access and the use of notes and textbooks during the session. The session will take place during the resit period and be scheduled by SAS. This lab based resit exam will replace CA components, the Learning Outcomes will be covered in the resit exam.
COMP284	University assessment ID / Departmental assessment ID / Weighting: 284 / CA2 / 50% 284.1 / CA1 / 50% CA: 2 assessment tasks, one for each of the scripting languages covered by the module. Failure on one or more assessment tasks can be compensated by higher marks on the other assessment tasks. Reassessment opportunity: Yes, each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the the task.
COMP285	University assessment ID / Departmental assessment ID / Weighting: 285 / CA2 / 50% 285.1 / CA1 / 50% Reassessment opportunity: Yes, each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the task.

COMP298	PRESENTATION The presentation will be made to a group of internship peers in a multi-disciplinary mini-conference. Each 10 minute presentation will be followed by a 10 minute discussion. PORTFOLIO The portfolio will comprise an overview of the research work completed during the internship (1000 words), discussion of the areas of learning achieved for the duration of the internship (1000 words), and a reflection on the student's own professional development with a summary of how this experience connects to the remainder of their study (500 words
COMP299	University assessment ID / Departmental assessment ID / Weighting: 299 / CA4 / 35% 299.1 / CA1 / 15% 299.2 / CA2 / 15% 299.3 / CA3 / 35% CA1: Introductory report: This report is marked by the academic supervisor and by a second marker who is another academic member of staff from the Department of Computer Science. CA2: Final Presentation: This report is marked by the industrial supervisor and second marked by the academic supervisor. CA3: Performance in the placement year: It is required for students to achieve a pass mark on this component in order for the module to be completed successfully. This report is marked by the industrial supervisor and second marked by the academic supervisor. CA4: Final report: This report is marked by the academic supervisor and by a second marker who is another academic member of staff from the Department of Computer Science. Reassessment opportunity: Yes for CA1 and CA4 only.

COMP304	University assessment ID / Departmental assessment ID / Weighting: 304 / Exam / 75% 304.1 / CT2 / 13% 304.2 / CT1 / 12% CA: Two class tests of 1 hour duration each to be held in a scheduled lecture or tutorial slot. Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP305	University assessment ID / Departmental assessment ID / Weighting: 305 / Exam / 70% 305.1 / CA1 / 15% 305.2 / CA2 / 15% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP309	University assessment ID / Departmental assessment ID / Weighting: 309 / Exam / 70% 309.1 / CA1 / 15% 309.2 / CA2 / 15% CA: 2 (sets of) assessment tasks. This work is not marked anonymously. Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.

COMP310	University assessment ID / Departmental assessment ID / Weighting: 310 / Exam / 100% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam. Pass Grade Undergraduate: 40% Pass Grade Postgraduate Taught: 50%
COMP313	University assessment ID / Departmental assessment ID / Weighting: 313 / Exam / 100% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP315	University assessment ID / Departmental assessment ID / Weighting: 315 / Exam / 100% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam. Pass Grade Undergraduate: 40% Pass Grade Postgraduate Taught: 50%

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COMP318	318 / Exam / 70% 318.1 / Class Test 1 / 10% 318.2 / CA2 / 10% 318.3 / CA3 / 10% CA: 2 (sets of) assessment tasks. This work is not marked anonymously. Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam. Pass Grade Undergraduate: 40% Pass Grade Postgraduate Taught: 50%
COMP319	University assessment ID / Departmental assessment ID / Weighting: 319 / Exam / 100% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed components, the Learning Outcomes will be covered in the resit exam.
COMP323	University assessment ID / Departmental assessment ID / Weighting: 323 / Exam / 70% 323.1 / CA1 / 15% 323.2 / CA2 / 15% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP324	University assessment ID / Departmental assessment ID / Weighting: 324 / Exam /70%

	324.1 / CA2 / 18% 324.2 / CA1 / 12% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) extenuating circumstances have been accepted (subject to confirmation by the Board of Examiners). There is no CA resit opportunity – the resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP326	University assessment ID / Departmental assessment ID / Weighting: 326 / Exam / 70% 326.1 / CA2 / 15% 326.2 / CA1 / 15% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP327	University assessment ID / Departmental assessment ID / Weighting: 327 / Exam / 60% 327.1 / CA1 / 10% 327.2 / CA2 / 15% 327.3 / CA3 / 15% CA: 3 (sets of) assessment tasks. This work is not marked anonymously. Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted.
COMP328	University assessment ID / Departmental assessment ID / Weighting: 328 / Exam/ 80% 328.1 / CA1 / 20%

Course	Assessment details
	Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP329	University assessment ID / Departmental assessment ID / Weighting: 329 / Class Test 1 / 40% 329.1 / CA2 / 50% 329.2 / CA3 / 10% CA1: Class Test CA2: Assignment CA3: Lab work Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. *Resit arrangements to be confirmed.*
COMP331	University assessment ID / Departmental assessment ID / Weighting: 331 / Exam / 70% 331.1 / CA1 / 15% 331.2 / CA2 / 15% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP335	University assessment ID / Departmental assessment ID / Weighting: 335 / CA1 / 15% 335.1 / CA2 / 35% 335.2 / CA3 / 35% 335.3 / CA4 / 15% CA1: Essay CA2: Lesson Plan and Activity Development CA3: Timetabled Outreach Sessions – Lesson Delivery CA4: Final Report Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted.
COMP336	University assessment ID / Departmental assessment ID / Weighting: 336 / Exam / 60% 336.1 / CA1 / 20% 336.2 / CA2 / 20% CA: Two assessment tasks (Not marked anonymously, each of which is expected to take approximately 18 hours of work to complete – each involves installing software, writing code and writing a report). Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP337	University assessment ID / Departmental assessment ID / Weighting: 337 / Exam / 70% 337.1 / CA1 / 15% 337.2 / CA2 / 15% CA: Two programming assignments. Reassessment opportunity: No resit opportunity for final year students,

	only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP338	University assessment ID / Departmental assessment ID / Weighting: 338 / Exam / 70% 338.1 / CA1 / 15% 338.2 / CA2 / 15% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP341	University assessment ID / Departmental assessment ID / Weighting: 341 / Exam / 80% 341.1 / CA2 / 10% 341.2 / CA1 / 10% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP342	University assessment ID / Departmental assessment ID / Weighting: 342 / Exam / 80% 342.1 / CA2 / 10% 342.2 / CA1 / 10% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted.

	Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP343	University assessment ID / Departmental assessment ID / Weighting: 343 / Exam / 70% 343.1 / CA1 / 15% 343.2 / CA1 / 15% Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted. Resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP390	University assessment ID / Departmental assessment ID / Weighting: 390 / CA3 / 60% 390.1 / CA1 / 15% 390.2 / CA2 / 25% CA1: Proposal CA2: Presentation CA3: Dissertation None of the project stages are marked anonymously. Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted.
COMP392	University assessment ID / Departmental assessment ID / Weighting: 392 / CA3 / 70% 392.1 / CA2 / 20% 392.2 / CA1 / 10% CA1: Specification CA2: Presentation CA3: Report None of the project stages are marked anonymously.

	Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted.
COMP396	University assessment ID / Departmental assessment ID / Weighting: 396 / CA1 / 20% 396.1 / CA2 / 30% 396.2 / CA3 / 50% CA1: Design Presentation/Documentation CA2: Evaluation of trading strategies CA3: Final report This work is not marked anonymously. Reassessment opportunity: No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted.
COMP591	University assessment ID / Departmental assessment ID / Weighting: 591 / CA3 / 60% 591.1 / CA1 / 20% 591.2 / CA2 / 20% Three Continuous Assessment Assignments are as following: CA1: Specification presentation and documentation. CA2: Final presentation including, where appropriate, software demonstration. CA3: Group report, individual report, peer assessment. This is the final assessment of the project. This work will not be marked anonymously.

	No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted.
COMP592	University assessment ID / Departmental assessment ID / Weighting: 592 / CA3 / 60% 592.1 / CA1 / 20% 592.2 / CA2 / 20% CA1: Specification and Design CA2: Presentation CA3: Dissertation None of the project stages are marked anonymously. No resit opportunity for final year students, only at the next ordinary sitting (subject to confirmation by the Board of Examiners) unless extenuating circumstances have been accepted.
COMP516	University assessment ID / Departmental assessment ID / Weighting: 516 / CA3/ 60% 516.1 / CA2 / 20% 516.2 / CA1 / 20% CA1: The group of students will deliver a presentation on their project in class. This work is not marked anonymously. CA2: A class test on the content covered in the lectures. CA3: The actual Research project of the groups submitted and assessed in the form of a final report. This work is not marked anonymously. Students will select a group project related to research (on a topic agreed between them and the examiner). This could include work on a research problem, literature review of a state-of-the-art or landmark CS topic, proposal of an MSc project, teaching and communications

Module	Assessment
	methods of research. Reassessment opportunity: Yes, CA resit opportunity available for CA2 and CA3 only. For CA1 there's no reassessment opportunity, as part of the task is speaking and maintaining eye-contact with larger audience. This is done during the lecture in front of all the other MSc (20+) students. It would be impossible to recreate such conditions during a resit. Each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the task.
COMP517	University assessment ID / Departmental assessment ID / Weighting: 517 / CA3 / 40% 517.1 / CA1 / 30% 517.2 / CA2 / 30% This work is not marked anonymously. Reassessment opportunity: Resit Canvas task will replace failed CA components, the Learning Outcomes will be covered in the resit task.
COMP518	University assessment ID / Departmental assessment ID / Weighting: 518 / Exam / 25% 518.1 / CA1 (SQL and Transactions) / 25% 518.2 / CA2 (Logical Database Modelling and Normalisation) / 25% 518.3 / CA3 (Relational Algebra and Entity-Relationship Modelling) / 25%
	Reassessment opportunity: Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP519	University assessment ID / Departmental assessment ID / Weighting: 519 / CA4 / 25% 519.1 / CA1 / 25% 519.2 / CA2 / 25% 519.3 / CA3 / 25% This work is not marked anonymously. Reassessment opportunity: Yes, CA resit opportunity available. Each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the task.
COMP521	University assessment ID / Departmental assessment ID / Weighting: 521 / Exam / 75% 521.1 / CA1 / 13% 521.2 / CA2 / 12% CA: Two class tests of 1 hour duration each to be held in a scheduled lecture or tutorial slot.

	Reassessment opportunity: Yes, resit exam will replace failed CA components, the Learning Outcomes will be covered in the resit exam.
COMP522	University assessment ID / Departmental assessment ID / Weighting: 522 / Exam / 60% 522.1 / CA1 / 20% 522.2 / CA2 / 20% Reassessment opportunity: Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP523	University assessment ID / Departmental assessment ID / Weighting: 523 / Exam / 70% 523.1 / CA1 / 15% 523.2 / CA2 / 15% Reassessment opportunity: Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP524	University assessment ID / Departmental assessment ID / Weighting: 524 / Exam / 70% 524.1 / CA1 / 15% 524.2 / CA2 / 15% CA: two assessment tasks. This work is not marked anonymously. Written Exam: open book written examination. The exam will be held as an "open book" exam, where the material allowed into the examination room is restricted to one sheet of A4 paper (single sided). The following text will be printed on the exam scripts: This will be held as an 'Open Book' examination according to the Regulations for the Conduct of Examinations (Appendix D to the Code of Practice of Assessment). The material you are allowed to take into the examination room is restricted to one single-sided sheet of A4 paper, prepared by yourself, with a content of

	your choice. The material is for your personal use only. The students are informed about this regulation a) at the beginning of the course, b) by a description on the course page on VITAL, c) by this module specification, and d) by an email sent by the student office on behalf of the Head of Department. To ensure that every student who takes the exam is informed by email, the email is sent closely after the latest point in time where a new student is allowed to enter the course in the running semester. Reassessment opportunity: Yes, CA resit opportunity available. Each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the task.
COMP525	University assessment ID / Departmental assessment ID / Weighting: 525 / Exam / 75% 525.1 / CA1 / 12.5% 525.2 / CA2 / 12.5% This work is not marked anonymously. Reassessment opportunity: Yes, CA resit opportunity available. Each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the task.

COMP526	University assessment ID / Departmental assessment ID / Weighting: 526 / Exam / 60% 526.1 / CA3 (In-class quizzes) / 15% 526.2 / CA1 (Programming Puzzle 1) / 10% 526.3 / CA2 (Programming Puzzle 2) / 10% 526.4 / CA4 (Class Discussion Participation) / 5% CA: There are four assessment tasks (e.g., assignments, quizzes). This work is not marked anonymously. Reassessment opportunity: Resit exam will replace all previously failed components, Learning Outcomes will be covered by the Resit exam.
COMP527	University assessment ID / Departmental assessment ID / Weighting: 527 / Exam / 70% 527.1 / CA2 / 15% 527.2 / CA1 / 15% CA: Two programming assignments. Reassessment opportunity: Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP528	University assessment ID / Departmental assessment ID / Weighting: 528 / CA3 / 40% 528.1 / CA2 / 35% 528.2 / CA1 / 25% Reassessment opportunity: Yes, CA resit opportunity available. Each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the task.
COMP529	University assessment ID / Departmental assessment ID / Weighting: 529 / Exam / 60%

	529.1 / CA1 / 20% 529.2 / CA2 / 20% Reassessment opportunity: Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP530	University assessment ID / Departmental assessment ID / Weighting: 530 / CA4 / 60% 530.1 / CA1 / 15% 530.2 / CA2 / 15% 530.3 / CA3 / 10% CA1: Specification and Proposed Design CA2: System Demonstration CA3: Meeting Record CA4: Portfolio and Individual Contribution. The Portfolio itself is worth 40%; the peer assessment exercise is worth 20%. Reassessment opportunity: Yes, CA resit opportunity available. Each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same; the deadline for the submission of work for each resit assessment task will be set by the module co-ordinator and will be part of the description of the assessment task; the deadline will typically fall within the resit period; the description of a resit assessment task will be provided at least four weeks before the deadline for the submission of work for the task.
COMP532	University assessment ID / Departmental assessment ID / Weighting: 532 / Exam / 70% 532.1 / CA1 / 15% 532.2 / CA2 / 15% CA1: The first report will be due in week 6. The first report will concern a task related to the state of the art literature in RL, evolutionary game

	theory, swarm intelligence (with a max of 5 pages). CA2: The second report will be due in week 10. The report of the second task will revolve around a student presentation during the tutorial sessions on one of the bio-inspired methods discussed during formal lectures (with a max of 5 pages). Reassessment opportunity: Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP533	There will be three programming assignments (10% each) and one (video) presentation (10%). This is concluded with the final examination (60%). University assessment ID / Departmental assessment ID / Weighting: 533 / Exam / 60% 533.1 / CA1 / 10% 533.2 / CA2 / 10% 533.3 / CA3 / 10% 533.4 / CA4 / 10% Resit exam replaces all previously failed components, module Learning Outcomes are covered by the resit exam.
COMP534	The module will be 100% CA assessed consisting of 3 assignments. 534 / CA3 / 35% 534.1 / CA2 / 35% 534.2 / CA1 / 30% Reassessment opportunity: Yes, CA resit opportunity available. Each resit assessment task will be different from the original assessment, except in the case of a skills-based assessment task, but the type of assessment will be the same.
COMP555	There will be a research presentation (40%) and a written report (60%). University assessment ID / Departmental assessment ID / Weighting: 555 / CA2 / 55% 555.1 / CA1 / 40% 555.2 / CA3 / 5%

	Reassessment opportunity: Yes, *details to be confirmed*
COMP557	University assessment ID / Departmental assessment ID / Weighting: 557 / Exam / 70% 557.1 / CA1 / 15% 557.2 / CA2 / 15% Reassessment opportunity: Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP559	University assessment ID / Departmental assessment ID / Weighting: 559 / Exam / 70% 559.1 / CA1 / 15% 559.2 / CA2 / 15% CA: This work is not marked anonymously. Reassessment opportunity: Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP575	University assessment ID / Departmental assessment ID / Weighting: 575 / Exam / 100% Reassessment opportunity: Resit exam will replace all previously failed components; Learning Outcomes will be covered by the Resit exam.
COMP598	University assessment ID / Departmental assessment ID / Weighting: 598 / CA1 / 100% This module is PASS / FAIL only. Reassessment opportunity: No, if a student fails to pass the module at the first sitting, students on the Year in Industry programmes will be transferred to the equivalent programme without the placement year.
COMP599	University assessment ID / Departmental assessment ID / Weighting: 599 / CA1 / 20% 599.1 / CA2 / 20% 599.2 / CA3 / 60% Reassessment opportunity: No, if a student fails to pass the module at the first sitting, students on the Year in Industry programmes will be transferred to the equivalent programme without the placement year.

COMP702	University assessment ID / Departmental assessment ID / Weighting:
	702 / CA1 / 15%
	702.1 / CA2 / 15%
	702.2 / CA3 / 60%
	CA1: Specification and Proposed Design
	CA2: Final Presentation
	CA3: Dissertation
	This work is not marked anonymously.
	Reassessment opportunity: Yes, only at the next ordinary sitting (subject to confirmation by the Board of Examiners), marks will be capped at 50% unless extenuating circumstances have been accepted.

Communication and Media Department Modules on Computer Science Programmes

Further information about the modules listed below is available at
https://www.liverpool.ac.uk/courses/subjects

https://www.liverpool.ac.uk/info/portal/pls/portal/tulwwwmerge.mergepage?p_template=m_ct&p_tulipproc=deptmodlist&p_params=%3Fp_dept_code%3DCT%26p_template%3Dm_ct

Any problems relating to or affecting your studies (for example Exemption from Late Penalties) on modules owed by the Department of Communication and Media, should be forwarded to the Department of Communication and Media's Student Experience Team:
SSCArts@liverpool.ac.uk
(https://www.liverpool.ac.uk/communication-and-media/student-support/)

Electrical Engineering & Electronics Department Modules on Computer Science Programmes

Further information about the modules listed below is available at
https://www.liverpool.ac.uk/courses/subjects

Any problems relating to or affecting your studies (for example Exemption from Late Penalties) on modules owed by the EEE, should be forwarded to the EEE Student Experience Team:
studyenq@liv.ac.uk

Environmental Sciences School Modules on Computer Science Programmes

Further information about the modules listed below is available at
https://www.liverpool.ac.uk/courses/subjects

Any problems relating to or affecting your studies (for example Exemption from Late Penalties) on modules owed by the School of Environmental Sciences, should be forwarded to the School of Environmental Sciences Student Experience Team:
envsci@liv.ac.uk
(https://www.liverpool.ac.uk/intranet/environmental-sciences-student/help,and,support/student-experience-team/)

Management School Modules on Computer Science Programmes
Further information about the modules listed below is available via
https://www.liverpool.ac.uk/courses/subjects

https://www.liverpool.ac.uk/info/portal/pls/portal/tulwwwmerge.mergepage?p_template=m_bl&p_tulipproc=deptmodlist&p_params=%3Fp_dept_code%3DBL%26p_template%3Dm_bl

Any problems relating to or affecting your studies (for example Exemption from Late Penalties) on modules owed by the Management School, should be forwarded to their Student Experience Team:
UG: ulmsugenq@liverpool.ac.uk
PGT: ulmspgenq@liverpool.ac.uk

Mathematics Department Modules on Computer Science Programmes

Further information about the modules listed below is available at
https://www.liverpool.ac.uk/courses/subjects

https://www.liverpool.ac.uk/info/portal/pls/portal/tulwwwmerge.mergepage?p_template=m_mf&p_tulipproc=deptmodlist&p_params=%3Fp_dept_code%3DMF%26p_term_code%3D201617%26p_template%3Dm_mf

Any problems relating to or affecting your studies (for example Exemption from Late Penalties) on modules owed by Mathematical Sciences, should be forwarded to the Maths Student Experience Team: mathstudentsupport@liverpool.ac.uk

Module Descriptions

Information regarding the various modules can be found via the following central University website – just locate your programme and navigate to the *Course content* section of the approriate year of study to explore the relevant module content:
https://www.liverpool.ac.uk/courses/subjects

PGT Summer Project – Computer Science

COMP702 MSC PROJECT (60 CREDITS)

The MSc project is undertaken over the summer period and leads to the submission of a written dissertation in September, when the programme finishes. This will investigate some real application of computing with the object of producing an agreed deliverable, in addition to the dissertation. The project work is usually associated with material covered in the taught research modules making up the programme. Alternatively, students can propose their own projects, or undertake projects based on the needs of local industries, provided that the proposal meets with the academic criteria for an MSc (level M) project.

Members of staff within the Department will manage the project, and students will be required to give regular progress reports and presentations on their work. This is extremely valuable experience, as such presentations are likely to be required in a future career.

Further details of project management, together with details of the projects on offer, will be provided closer to the project start date. There will also be information available on-line nearer the time.

PGT Year in Industry Modules – Computer Science

COMP598 MSC PLACEMENT EXPERIENCE

(FHEQ Level 7 module)

The placement experience module will be assessed in terms of a portfolio containing a number of documents as articulated in the COMP598 module specification. For the project module the assessment comprises: (i) an interim report (20% in January), (ii) an oral presentation (20% in May), and (iii) a final report (60% in May).

Preparation for the year in industry will begin in Year 1 through COMP516 "Research Methods in Computer Science" which is a 15-credit module. During the placement which is a 30-week minimum placement, the student should complete two-60 credit modules: (i) COMP598 MSc Placement Experience and (ii) COMP599 MSc Industrial Project. In order to receive the MSc degree, the student should pass both modules. COMP598 is a pass/fail module and will not contribute to the MSc degree classification and cannot be considered as a PG Dip exit award module since its emphasis is on gaining industrial experience. COMP599 is focused on doing an industrial research project and it will be chosen by the student by the end of semester 2 in Year One. In situations where a student is not able to find a placement by the end of semester 2, or fails to complete the industrial placement, the student will be able to transfer to the standard version of the programme and commence a new project at the University.

The placement and project will take place from an agreed starting date (typically September, but an earlier date is acceptable), in an appropriate IT environment. The department will have a dedicated advisor working with UoL's Careers and Employability Services, so as to assist students in gaining a placement. As noted above if a student has failed to find a placement and project, the student will transfer to the one-year version of the programme and commence a new project at the University.

All placements, and the project work to be carried out as part of the placement, will be agreed by the students and industrial placement partners, and approved by the MSc Programme Director. Each student on placement will have an industrial supervisor in the company and an academic supervisor within the Department. A dedicated liaison advisor/coordinator will be appointed by the School/Department.

The supervisor at the University, working with the industrial supervisor, will be responsible for the assessment of the placement experience and the industrial project modules (COMP598 and COMP599). The placement experience module (COMP598) will be assessed in terms of a portfolio containing a number of documents as articulated in the COMP598 module specification. For the project module the assessment comprises: (i) an interim report (20% in January), (ii) an oral presentation (20% in May), and (iii) a final report (60% in May).

COMP599 MSC INDUSTRIAL PROJECT

(FHEQ Level 7 module)

This module is focused on doing an industrial research project and it will be chosen by the student by the end of semester 2 in Year One. In situations where a student is not able to find a placement by the end of semester 2, or fails to complete the industrial placement, the student will be able to transfer to the standard version of the programme and commence a new project at the University.

Preparation for the year in industry will begin in Year 1 through COMP516 "Research Methods in Computer Science" which is a 15-credit module. During the placement which is a 30-week minimum placement, the student should complete two-60 credit modules: (i) COMP598 MSc Placement Experience and (ii) COMP599 MSc Industrial Project. In order to receive the MSc degree, the student should pass both modules. COMP598 is a pass/fail module and will not contribute to the MSc degree classification and cannot be considered as a PG Dip exit award module since its emphasis is on gaining industrial experience. COMP599 is focused on doing an industrial research project and it will be chosen by the student by the end of semester 2 in Year One. In situations where a student is not able to find a placement by the end of semester 2, or fails to complete the industrial placement, the student will be able to transfer to the standard version of the programme and commence a new project at the University.

The placement and project will take place from an agreed starting date (typically September, but an earlier date is acceptable), in an appropriate IT environment. The department will have a dedicated advisor working with UoL's Careers and Employability Services, so as to assist students in gaining a placement. As noted above if a student has failed to find a placement and project, the student will transfer to the one-year version of the programme and commence a new project at the University.

All placements, and the project work to be carried out as part of the placement, will be agreed by the students and industrial placement partners, and approved by the MSc Programme Director. Each student on placement will have an industrial supervisor in the company and an academic supervisor within the Department. A dedicated liaison advisor/coordinator will be appointed by the School/Department.

The supervisor at the University, working with the industrial supervisor, will be responsible for the assessment of the placement experience and the industrial project modules (COMP598 and COMP599). The placement experience module (COMP598) will be assessed in terms of a portfolio containing a number of documents as articulated in the COMP598 module specification. For the project module the assessment comprises: (i) an interim report (20% in January), (ii) an oral presentation (20% in May), and (iii) a final report (60% in May).