

UNIVERSITY OF KENT Programme Specification

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she passes the programme. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found by following the links from:
<http://www.cs.kent.ac.uk/teaching/>

The accuracy of the information contained in this specification is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Degree and Programme Titles

BSc Computer Science
BSc Computer Science (Artificial Intelligence)
BSc Computer Science (Consultancy)
BSc Computer Science (Networks)

All of the above also available "with a Year in Industry".

1. Awarding Institution/Body	University of Kent	
2. Teaching Institution	University of Kent	
3. Teaching Site	Canterbury Campus	
4. Programme accredited by:	See section 17	
5. Final Award	BSc (Hons), BSc, Diploma, Certificate	
6. Programmes	UCAS	Programme
7. and UCAS Codes	Code	
	G400	Computer Science
	G404	Computer Science with a Year in Industry
	G403	Computer Science (Consultancy)
	G406	Computer Science (Consultancy) with a Year in Industry
	G421	Computer Science (Networks)
	G420	Computer Science (Networks) with a Year in Industry
	G4G7	Computer Science (Artificial Intelligence)
	G4GR	Computer Science (Artificial Intelligence) with a Year in Industry
8. Relevant QAA subject benchmarking group(s)	Computing 2007; Note: the subject benchmarks shown above as deleted relate to programmes that have been formally withdrawn earlier.	
9. Date of		

production/revision	June 2012
10. Applicable cohort(s)	2012 for Stage 1 entry and 2013 for Stage 2 entry onwards. UCAS code from 2010.

11. Educational Aims of the Programme

All the Computer Science programmes aim to:

1. Provide a programme that will attract and meet the needs of both those contemplating a career in computing and those motivated primarily by an intellectual interest in Computer Science.
2. Be compatible with widening participation in higher education by offering a wide variety of entry routes.
3. Provide a sound knowledge and systematic understanding of the principles of Computer Science.
4. Provide computing skills that will be of lasting value in a field that is constantly changing.
5. Offer a range of options to enable students to match their interests and study some selected areas of computing in more depth.
6. Provide teaching which is informed by current research and scholarship and which requires students to engage with aspects of work at the frontiers of knowledge.
7. Develop general critical, analytical and problem solving skills that can be applied in a wide range of different computing and non-computing settings.

The Computer Science Programme additionally aims to:

- Enable students to meet the above aims more deeply by providing both a broad overview of the subject and enabling specialisation in selected areas.
- Several themed pathways build on the core Computer Science modules to allow students to pursue particular interests.

The Computer Science and Management Science programmes additionally aim to:

- Provide knowledge of key areas in Management Science.

The Computer Science (Business) programmes additionally aim to:

- Provide a knowledge of key areas in Business Administration

The Computer Science (AI) programmes additionally aim to:

- Provide knowledge of key areas in Artificial Intelligence

The programmes that include a year in industry additionally aim to:

- Provide relevant work experience.
- Provide an opportunity to develop knowledge understanding and skills of relevance to Computer Science within an industrial or commercial organisation.

12. Programme Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the subject benchmarking statements for Computing (**CO-SB**),

Note: the subject benchmarks shown above as deleted relate to programmes that have been formally withdrawn earlier.

Knowledge and Understanding	Teaching/learning and assessment methods and strategies used to enable outcomes to be achieved and demonstrated
A. Knowledge and Understanding of:	
<i>All Computer Science programmes:</i> 1. Hardware: the major functional components of a computer system. 2. Software: Software: programming languages and practise; tools and packages; computer applications; structuring of data and information. 3. Communication and interaction: basic computer communication network concepts; communication between computers and people; the control and operation of computers. 4. Practise: problem identification and analysis; design development, testing and evaluation. <i>Outcomes specific to:</i> <i>BSc Computer Science</i> <i>BSc Computer Science with a Year in Industry</i> <i>BSc Computer Science (AI)</i> <i>BSc Computer Science (AI) and a Year in Industry</i> 5. Theory: algorithm design and analysis; formal methods and description; modelling <i>Note: A6-A11 relate to degree programmes that have been formally withdrawn earlier.</i> <i>Outcomes specific to:</i> <i>Year in Industry programmes</i> 13. Aspects of the core subject areas from the perspective of a commercial or industrial organisation. <i>Outcomes specific to:</i> <i>BSc Computer Science (AI)</i> <i>BSc Computer Science (AI) and a Year in Industry</i> 14. The philosophical and psychological principles of knowledge and cognition. 15. Machine intelligence: systems,	Teaching/Learning Acquisition is through lectures, supported where appropriate by classes and/or laboratory work. Self-directed learning is facilitated by directed reading, study guides and web-based material. Core aspects of computing are covered in the first year/stage when there is an emphasis on supporting students via supervised classes and laboratory sessions. These core components are built on in year/stage 2 with more emphasis on self-directed study via directed reading and research. In year/stage 3, the project provides an opportunity for independent and/or group work under supervision from academic staff. Assessment Assessment is through a combination of unseen written examinations, assessed coursework and both individual and group project work. Coursework consists of both written reports and practical assignments.

algorithms and applications.	
Skills and Other Attributes B. Intellectual Skills:	
<i>All Computer Science programmes:</i> 1. Modelling: knowledge and understanding in the modelling and design of computer-based systems in a way that demonstrates comprehension of the trade-off involved in design choices. (CO-SB3.2) 2. Reflection and communication: present succinctly to a range of audiences rational and reasoned arguments (CO-SB3.2) 3. Requirements: Identify and analyse criteria and specifications appropriate to specific problems and plan strategies for their solution (CO-SB3.2) 4. Criteria evaluation and testing: Analyse the extent to which a computer-based system meets the criteria defined for its current use and future development. (CO-SB3.2) 5. Methods and tools: Deploy appropriate theory, practices, and tools for the specification, design, implementation, and evaluation of computer-based systems. (CO-SB3.2) 6. Professional responsibility: Recognize and be guided by the professional, economic, social, environmental, moral and ethical issues involved in the sustainable exploitation of computer technology. (CO-SB3.2) 7. Computational thinking: demonstrate a basic analytical ability and its relevance to everyday life. (CO-SB3.2) <i>Outcomes specific to:</i> <i>Year in Industry programmes</i> 8. Apply some of the intellectual skills specified for the programme from the perspective of a commercial or industrial organisation. <i>Note: B9-B10 related to degree</i>	Teaching/Learning Intellectual skills are developed through the teaching and learning programme outlined below. Students develop critical reflection by verbal and written discussion of key themes introduced in the core modules. Project work contributes to the development of these skills by providing the opportunity to consider larger practical and theoretical problems. Assessment Assessment is through a combination of unseen written examinations, assessed coursework and both individual and group project work. Coursework consists of both written reports and practical assignments.

programmes that have been formally withdrawn earlier.	
9.	
C. Subject-specific Skills:	
<i>All Computer Science programmes:</i> 1. Design and implementation: Specify, design, and implement computer-based systems. (CO-SB3.2) 2. Evaluation: Evaluate systems in terms of general quality attributes and possible tradeoffs presented within the given problem (CO-SB3.2) 3. Information management: Apply the principles of effective information management, information organisation, and information-retrieval skills to information of various kinds, including text, images, sound, and video. (CO-SB3.2) 4. Tools: Deploy effectively the tools used for the construction and documentation of software, with particular emphasis on understanding the whole process involved in using computers to solve practical problems. Operation: Operate computing equipment and software systems effectively. (CO-SB3.2) <i>Note: C5-C11 related to degree programmes that have been formally withdrawn earlier.</i> <i>Outcomes specific to: Year in Industry programmes</i> 13. Apply some of the subject-specific skills specified for the programme from the perspective of a commercial or industrial organisation. <i>Outcomes specific to: BSc Computer Science (AI) BSc Computer Science (AI) and a Year in Industry</i> 14. Identify and develop solutions for computational problems requiring machine intelligence. (CO-SB3.2)	Teaching/Learning Acquisition of computing specific skills is through lectures, classes and directed study. From the start of the course, students receive guidance and gain practical experience via supervised practical classes and directed study. As the programme progresses, these skills are further encouraged by the introduction of larger scale problems and project work. Assessment Assessment is through a combination of unseen written examinations, assessed coursework and both individual and group project work. Coursework consists of both written reports and practical assignments.
D. Transferable Skills:	
<i>All Computer Science programmes:</i>	General IT facilities are used throughout

1. Teamwork: Be able to work effectively as a member of a development team. (CO-SB3.3) 2. Communication: Make succinct presentations to a range of audiences about technical problems and their solutions. (CO-SB3.2) 3. Information Technology: Effective use of general IT facilities; information retrieval skills (CO-SB3.3) 4. Numeracy and literacy: understand and explain the quantitative and qualitative dimensions of a problem (CO-SB3.3,) 5. Self management: Managing one's own learning and development, including time management and organisational skills (CO-SB3.3) 6. Professional Development: Appreciating the need for continuing professional development in recognition of the need for lifelong learning (CO-SB3.3)	the course for the preparation of written work. Browsers, search engines and catalogues are used for research and self-study material. All students work within teams during the course and provide presentations of their work to both their peers and academic staff. Assessment Assessment is through a combination of unseen written examinations, assessed coursework and both individual and group project work. Coursework consists of both written reports and practical assignments.
For more information on the skills provided by individual modules and on the specific learning outcomes associated with the Certificate, Diploma and non-honours degree awards, see the module mapping	

13. Programme Structures and Requirements, Levels, Modules, Credits and Awards

The Computer Science programmes are normally studied over three years full-time with an additional industrial placement year for the “Year in Industry” variant. Direct entry to Stage 2 is available to students with appropriate prior learning.

Study is undertaken at three levels (one for each year of study). Each year of the programme is arranged in 2 x 12-week terms and a final 6-week term, 30 weeks in total. The programme is divided into study blocks called modules. Most modules have a credit value of 15 or 30 credits. Each 15-credit module represents approximately 150 hours of student learning, endeavour and assessment.

All students take required modules. All students must take in every stage, modules amounting to 120 credits, making up their choices from the list of optional modules. Required modules must be passed before students progress to the next stage of the programme.

The programme is divided into three stages for Computer Science programmes and four stages for the “Year in Industry” programmes. Each stage comprising 120 credits represents an academic year of study and students must achieve specified requirements before being permitted to proceed to the next stage.

Entry to Stage 2 of the CS(Consultancy) programme (including admission via direct

entry) is subject to interview and may also be subject to quotas. Students completing Stage 1 but unable to enter Stage 2 of CS(Consultancy) will transfer to an alternative CS programme.

Classification of degrees is based on the overall average of marks obtained after the first stage, taking into account weightings for examinable modules and the following stage weightings:

Three stage programmes (including direct stage 2 entry):

Stage 2	40%
Stage 3	60%

Year in Industry programmes:

Stage 2	35%
Stage S (Placement Year)	10%
Stage 3	55%

In the Stage 3 students undertake a compulsory 30-credit project and may select up to six 15-credit modules depending on the programme from a selection of optional modules. The optional modules are primarily research led and consequently the list of modules will vary according to emerging research interests and the availability of individual academics.

The structure of the programme and the modules that make it up, their levels, credits and the terms in which they are taught, are shown below. Details of each module can be found at <http://www.cs.kent.ac.uk/teaching/>

At its discretion the University allows for narrow failure in a small proportion of modules to be compensated by good performance in other modules or, in cases of documented illness or other mitigating circumstances, condoned. Failure in certain modules, however, may not be compensated or condoned, as indicated by the symbol * below.

Students successfully completing Stage 1 of the programme and meeting credit framework requirements who do not successfully complete Stage 2 will be eligible for the award of the Certificate. Students successfully completing Stage 1 and Stage 2 of the programme and meeting credit framework requirements who do not successfully complete Stage 3 will be eligible for the award of the Diploma. For an award in two subjects at least 37.5% of the credits should come from each half of an 'and' and at least 65% of the major and at least 25% of the minor for a 'with' award.

The programme is studied over three years full time. It is divided into three stages each comprising 120 credits and students must successfully complete each stage before being permitted to proceed to the next stage. A degree without honours will be awarded where students achieve 300 credits with at least 150 credits at level I or above including at least 60 credits at level H or above. Students may not progress to the non-honours degree programme; the non-honours degree programme will be awarded as a fallback award only.

Some opportunity is available to allow wild modules to be taken subject to reasonable timetabling constraints.

Details of programme structure and requirements are subject to change without notice.

Modules by term and stage

In the tables below:

- indicates compulsory module
- o indicates optional module
- each • or o indicates 15 credits

Standard entry to stage 1

Stage 1	Term	level	Credits	CS	CS (AI)	CS (networks)	CS (consultancy)
Required Modules							
CO320 Introduction to programming	A	C	15	•	•	•	•
CO322 Foundations of computing I	A	C	15	•	•	•	•
CO324 Computer Systems	A	C	15	•	•	•	•
CO334 People and computing	A	C	15	•	•	•	•
CO520 Further object-oriented programming	S	I	15	•	•	•	•
CO325 Foundations of computing II	S	C	15	•	•	•	•
CO323 Databases and the web.	S	C	15	•	•	•	•
CO328 Human computer interaction	S	C	15	•	•	•	•

Stage 2	Term	level	Credits	CS	CS (AI)	CS (networks)	CS (consultancy)
Required Modules							
CO510 Software engineering	A&S	I	30	••	••	••	••
CO518 Algorithms, correctness & efficiency	A	I	15	•	•	•	•
CO519 Theory of computing	A	I	15	•	•	•	•
CO539 Web development	A	I	15	•	•	•	•
CO545 Functional concurrency	S	I	15	•	•	•	
CO532 Database systems	S	I	15	•	•	•	•
CO527 Operating systems and architecture	S	I	15	•		•	•
CO528 Introduction to intelligent systems	S	I	15		•		
CB680 Introduction to marketing	S	C	15				•
CO523 Fundamentals of Programming and Logic.	A	I	15	d		d	d

d : depending on educational background, stage 2 direct entry students may be required to take CO523 at stage 2 in place of CO519 – in that case, CO519 would be taken in stage 3.

Stage S (4 year programmes only)	Term	level	Credits	CS	CS (AI)	CS (networks)	CS (consultancy)
Required Modules							
CO790 Placement Year *	-	I	120	•	•	•	•

Stage 3	Term	level	credits	CS	CS (AI)	CS (networks)	CS (consultancy)
Required Modules							
CO600 Group Project *	A&S	H	30	pp	pp	pp	
CO620 Research Project *	A&S	H	30	pp	pp	pp	
Co650 KITC Project *	A&S	H	30	pp	pp	pp	••
Co545 Functional concurrency	S	I	15				•
Co633 Computer Networks and Communication	A	H	15			•	
Co634 Computer Security and Cryptography	S	H	15			•	
CO636 Cognitive Neural Networks	A	H	15		•		
CO637 Natural Computation	S	H	15		•		
Co519 Theory of computing [Only for stage 2 direct entry students who did not take this module at stage 2.]	A	I	15	•		•	•
Optional modules (indicative)							
Co653 Advanced Programming Techniques		H	15	o	o	o	o
Co654 Functional Programming		H	15	o	o	o	o
Co656 Concurrency Design and Practice		H	15	o	o	o	o
Co633 Computer Networks and Communication		H	15	o	o		o
Co634 Computer Security and Cryptography		H	15	o	o		o
CO636 Cognitive Neural Networks		H	15	o		o	o
CO637 Natural Computation		H	15	o		o	o
CO639 Electronic Commerce		H	15	o	o	o	o
CO641 Comp Graphics and Animation		H	15	o	o	o	
Co643 Computing Law and Professional Responsibility		H	15	o	o	o	o
CO645 IT Consultancy Practice 2	A or S	H	15	o	o	o	o
CO646 Computing in the classroom	S	H	15	o	o	o	o

CO831 Mobile and Ubiquitous Comp		M	15	o	o	o	o
CO832 Data Mining and Knowledge Discovery		M	15	o	o	o	o
PL583 Philosophy of Cognitive Science and Artificial Intelligence	S	H	30	o	o		
CB612 New Enterprise Start-up	A	I	15	o	o	o	o
EL561 Image Analysis and Applications	A&S	I	15	o	o		
EL667 Embedded Computer Systems	A&S	H	15	o			

Notes: pp: students are required to take one of the projects thus indicated

14. Support for Students and their Learning

- Orientation programme for all students registered for Computer Science courses
- Introductory talks at the start of each teaching term of Stages 2 and 3
- Course handbook for all Stages
- On-line Student Data System
- An extensive Computing Laboratory website containing
 - information on all Computer Science modules including where appropriate
 - Module Learning Outcomes
 - module specification
 - details of any classes
 - module assessment
 - course material
 - anonymous question pages
 - copies of course handbooks
 - past examination papers
 - staff/student liaison information including
 - details of student representatives
 - minutes of meetings
- Assignment to a tutor who monitors individual student progress
- University central support services
 - Unit for the Enhancement of Learning and Teaching
 - Careers Service
 - Medical Centre
 - Counselling Service
 - Computing Service
 - Library Service
 - Disability and Dyslexia Support Service
 - Centre for English and World Languages.
- Administrative support via the Course Administration Office
- Industrial placement support via an Industrial Placement co-ordinator and visits by academic staff

15. Entry Profile

Entry Route

For fuller information, please refer to the University prospectus

Candidates must be able to satisfy the general admission requirements of the University and the subject-specific requirements of the Computing Laboratory. Please refer to the General Requirements and Computer Science sections in the

University prospectus for full details.

Note: for students who are not native speakers of English the standard IELTS requirements will apply.

General Minimum requirements:

- You must be at least 17 years old by 20 September in the year you begin your programme. There is no upper age limit to studying.
- Five GCSE passes, including English Language or Use of English, and at least two subjects at A level. See Curriculum 2000 for details of our minimum requirements for the new AS levels tariff.

A levels and AS levels:

- 340points over 21 units, of which 18 at A level.
- GCSE Mathematics grade C required

International Baccalaureate:

- 33points

BTEC National Certificates/Diplomas:

- Diploma: DDD overall
- Certificate: counts as double A level (e.g. DD is 240 points)
- BTEC QCF Extended Diploma: DDD overall
- Direct entry to stage 2: typically distinction at HND level

Mature Students

- For mature students without “traditional” qualifications we ask for proof of any recent study or of an ability to complete a degree course successfully

What does this programme have to offer?

- High quality teaching based that was rated “Excellent” after a visit by independent assessors from the Higher Education Funding Council
- Teaching that is informed by research activity, using research-led teaching whenever possible
- The development of a broad range of skills that are highly sought after by employers and which open up a wide range of careers to graduates, within Computing and other professional fields.
- Programming, modelling and design skills you can use throughout a career in Computing
- Coverage of software engineering principles which underlie large scale programme construction
- Strong links with Industry that are maintained through an ‘Industrial Panel’ and which result in industrial placements and joint research projects.
- An optional year in industry that provides valuable experience

Personal Profile

Desirable qualities include:

- an enthusiasm about computing and related subjects
- a willingness to accept new ideas and be flexible in your thinking
- a willingness to work with others
- good oral and written communication skills
- an interest in developing a career in a computing related area

16. Methods for Evaluating and Enhancing the Quality and Standards of Teaching and Learning

Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards

- Student evaluation of individual modules taught
- Student representation on key committees
- External accreditation of courses
- Periodic programme reviews
- Annual staff appraisal
- Annual module and programme monitoring reports (includes review of progression and achievement statistics)
- External examiners' reports
- Active staff development programme
- QAA Institutional Audit
- Continuous monitoring of student progress and attendance
- Vetting process of examination questions by module team, and external examiners
- External examiners attending Board of Examiners
- External Examiners' reports
- Departmental staff acting as external examiners at other institutions
- Double marking and/or moderation of examinations and some assessed work
- Industrial links
- Evaluation of graduate destination statistics
- Departmental director of learning and teaching
- Module teams
- Programme Teams

Committees with responsibility for monitoring and evaluating quality and standards

- School of Computing Staff/student liaison committee
- School Learning and Teaching Committee
- School of Computing Boards of Studies
- School of Computing Board of Examiners
- Faculty and University Learning and Teaching Committees
- Faculty Board
- Board of examiners
- Programme Approval sub-committee of the University Learning and Teaching Board

Mechanisms for gaining student feedback on the quality of teaching and their learning experience

- National Student Survey
- University Internal Student Surveys
- Student evaluation of individual modules
- Computing Staff/student liaison committee
- Discussions with tutor
- Discussions with senior tutor
- Newsgroups for each year of Computer Science
- Anonymous question pages for individual modules
- Student programme evaluations
- Informal meetings and social contact with students (including student role in recruitment activities)
- Student representation on department committees
- Student representation on faculty committees
- Student representation on university committees

Staff Development priorities include:

- Staff members have an individual allocation of funds which they may use to develop any of their interests, including those of teaching and learning
- Newly appointed lecturers, teaching fellows and computing fellows who have no prior teaching experience take part in the University of Kent Postgraduate Certificate in Higher Education qualification
- Staff training of various kinds including appraiser training, interview training, meeting skills etc.
- Study leave is available at the rate of one term in seven
- Participation in staff development week
- Annual appraisal of staff
- Research group support for research-led teaching
- Research seminars
- Annual away-days that cover a number of staff-related issues
- Module team meetings
- Regular formal and informal collaboration in programme development
- Attendance at relevant industry/business conferences/seminars
- Conference attendance (with or without departmental funding)
- Minimum expected qualifications for appointments to lecturing posts
- Minimum expected research record for appointments to lecturing posts
- Membership of relevant professional/academic bodies
- Widening participation
- Health and safety
- Participation on learning and teaching innovatory projects

17. Indicators of Quality and Standards

- Reports from External Examiners
- Degree results and graduate recruitment statistics
- Independent review of the quality of educational provision in the Computing Laboratory by the Higher Education Funding Council subject review process achieving an excellent grading.
- **Accreditation by the British Computer Society**
- **Full Chartered IT Professional (CITP) and CEng (partial):**
 - Computer Science
 - Computer Science with a Year in Industry
 - Computer Science (Artificial Intelligence)
 - Computer Science (Artificial Intelligence) with a Year in Industry
- **Applied for:**
 - Computer Science (Consultancy)
 - Computer Science (Consultancy) with a Year in Industry
 - Computer Science (Networks)
 - Computer Science (Networks) with a Year in Industry

The following reference points were used in creating these specifications:

- QAA benchmark statements for Computing (2007); Mathematics, Statistics and Operational Research and General Business and Management
- Requirements of the British Computer Society. Computer Science, and Computer Science with Artificial Intelligence programmes fully meet the educational requirements for CITP registration and partially meet those for CEng registration.

Computer Science and Management Science, and Business Computing programmes partially meet the educational requirements for CITP registration.

- Requirements of the IEE
- Association of Computing Machinery, Computing Curricula 2001
- Staff Research
- University plan/Learning and Teaching Strategy

25 June 2012

Learning Outcomes Matrix for CS Programmes

CS	A1	A2	A3	A4	A5	A13	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C13	D1	D2	D3	D4	D5	D6
Required																									
CO320		X		X			X					X	X		X	X		X				X		X	
CO322													X										X	X	
CO324	X	X	X																		X	X			
CO334	X	X	X					X				X								X	X	X		X	X
CO325													X										X	X	
CO323		X		X			X			X		X			X	X	X	X				X		X	
CO328			X	X			X		X			X			X	X	X	X		X		X		X	
CO520		X		X			X				X	X	X		X	X									
CO510		X	X	X			X	X	X	X	X	X			X	X	X	X		X	X	X	X	X	X
CO518		X		X	X		X		X	X	X		X		X	X							X	X	
CO519				X	X		X		X	X	X	X	X		X			X					X	X	
CO539		X	X	X			X		X	X	X				X	X	X	X				X		X	
CO545		X	X	X	X		X				X		X		X							X		X	
CO527	X	X									X				X	X		X			X	X		X	
CO532		X		X	X		X	X	X						X	X	X				X	X		X	
Direct Entry																									
CO523		X	X	X	X		X				X	X	X		X	X		X				X		X	
Year in industry																									
CO790						X								X					X	X	X	X	X	X	X
One of																									
CO600	O	X	O	X	O	O	X	X	X	X	X	X	O	O	X	X	X	X	O	X	X	X	O	X	X
CO620	O	X	O	X	O	O	X	X	X	X	X	O	O	O	X	X	X	X	O		X	X	O	X	O
CO650	X	X	X	X			X	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X
Options																									
CO528		X		X	X		X			X			X		X						X	X		X	
CO653		X						X				X			X	X		X			X	X	X	X	
CO654		X		X	X		X			X	X		X		X							X		X	
CO656	X	X	X		X		X				X		X		X							X		X	
CO633			X	X			X		X	X	X				X			X			X	X	X	X	
CO634	X	X	X						X	X	X	X			X	X						X	X	X	
CO636		X		X			X	X							X					X	X	X		X	
CO637		X		X	X		X						X		X	X						X		X	
CO639		X					X	X	X	X	X	X	X		X	X	X	X			X	X		X	
CO641	X	X	X	X			X				X		X		X			X			X	X	X	X	
CO643			X	X			X			X	X	X		X							X				X
CO645	X	X	X	X			X	X	X	X	X	X		X		X	X	X		X	X	X	X	X	X
CO646								X												X	X	X		X	X
CO831	X	X	X	X			X	X	X			X			X	X	X	X			X	X		X	
CO832		X		X	X		X		X	X	X		X			X	X	X				X		X	
EL561	X			X					X		X				X						X				
EL667	X	X	X	X					X	X	X				X	X		X				X		X	
PL583																									
CB612													X								X	X			X

Notes:

- Learning outcomes for non-CO modules are indicative, as specifications for such modules have not necessarily been written directly in terms of the learning outcomes for CO programmes.
- Learning outcomes are marked as O for project modules then these are dependent on the chosen project topic.
- LOs: A13, B8 and C13 only relate to the Year in Industry version of this degree programme.
- Module CO790 is only taken by students taking the year in industry version of this degree programme.

Learning Outcomes Matrix for CS(AI) Programmes

CS(AI)	A1	A2	A3	A4	A5	A13	A14	A15	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C13	C14	D1	D2	D3	D4	D5	D6
Required																												
CO320		X		X					X					X	X		X	X		X					X		X	
CO322															X											X		X
CO324	X	X	X																					X	X			
CO334	X	X	X							X				X									X	X	X		X	X
CO325															X											X	X	
CO323		X		X					X			X		X			X	X	X	X					X		X	
CO328			X	X					X		X			X			X	X	X	X			X		X		X	
CO520		X		X					X				X	X	X		X	X										
CO510		X	X	X					X	X	X	X	X	X			X	X	X	X			X	X	X	X	X	X
CO518		X		X	X				X		X	X			X		X	X								X	X	
CO519				X	X				X		X	X	X		X		X			X						X	X	
CO539		X	X	X					X		X	X	X				X	X	X	X					X		X	
CO545		X	X	X	X				X				X		X		X								X		X	
CO527	X	X											X				X	X		X				X	X		X	
CO528		X		X	X		X	X	X			X			X		X				X			X	X		X	
CO532		X		X	X				X	X	X						X	X	X					X	X		X	
CO636		X		X			X	X	X	X							X				X	X	X	X		X		
CO637		X		X	X			X	X						X		X	X			X				X		X	
Year in industry																												
CO790						X										X					X		X	X	X	X	X	X
One of																												
CO600	O	X	O	X	O	O	O	O	X	X	X	X	X	X	O	O	X	X	X	X	O	O	X	X	X	O	X	X
CO620	O	X	O	X	O	O	O	O	X	X	X	X	X	O	O	O	X	X	X	X	O	O		X	X	O	X	O
CO650	X	X	X	X					X	X	X	X	X	X		X	X	X	X	X			X	X	X	X	X	X
Options																												
CO653		X								X			X				X	X		X				X	X	X	X	
CO654		X		X	X				X			X	X		X		X								X		X	
CO656	X	X	X		X				X				X		X		X								X		X	
CO633			X	X					X		X	X	X				X			X				X	X	X	X	
CO634	X	X	X								X	X	X	X			X	X							X	X	X	
CO639		X							X	X	X	X	X	X	X		X	X	X	X				X	X		X	
CO641	X	X	X	X					X				X		X		X			X				X	X	X	X	
CO643			X	X					X			X	X	X		X								X				X
CO645	X	X	X	X					X	X	X	X	X	X		X		X	X	X			X	X	X	X	X	X
CO646										X													X	X	X		X	X
CO831	X	X	X	X					X	X	X			X			X	X	X	X				X	X		X	
CO832		X		X	X			X	X		X	X	X		X			X	X	X		X			X		X	
EL561	X			X				X			X		X				X		X	X		X		X				
PL583							X	X														X						
CB612															X									X	X			X

Notes:

- Learning outcomes for non-CO modules are indicative, as specifications for such modules have not necessarily been written directly in terms of the learning outcomes for CO programmes.
- Learning outcomes are marked as O for project modules then these are dependent on the chosen project topic.
- LOs: A13, B8 and C13 only relate to the Year in Industry version of this degree programme.
- Module CO790 is only taken by students taking the year in industry version of this degree programme.

Learning Outcomes Matrix for CS(Networks) Programmes

CS (Networks)	A1	A2	A3	A4	A5	A13	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C13	D1	D2	D3	D4	D5	D6
Required																									
CO320		X		X			X					X	X		X	X		X				X		X	
CO322													X										X	X	
CO324	X	X	X																		X	X			
CO334	X	X	X					X				X								X	X	X		X	X
CO325													X										X	X	
CO323		X		X			X			X		X			X	X	X	X				X		X	
CO328			X	X			X		X			X			X	X	X	X		X		X		X	
CO520		X	X	X			X				X	X	X		X	X	X								
CO510		X	X	X			X	X	X	X	X	X			X	X	X	X		X	X	X	X	X	X
CO518		X		X	X		X		X	X			X		X	X							X	X	
CO519				X	X		X		X	X	X		X		X			X					X	X	
CO539		X	X	X			X		X	X	X				X	X	X	X				X		X	
CO545		X	X	X	X		X				X		X		X							X		X	
CO527	X	X									X				X	X		X			X	X		X	
CO532		X		X	X		X	X	X						X	X	X				X	X		X	
CO633			X	X			X		X	X	X				X			X			X	X	X	X	
CO634	X	X	X						X	X	X	X			X	X						X	X	X	
Direct Entry																									
CO523		X	X	X	X		X				X	X	X		X	X		X				X		X	
Year in industry																									
CO790						X								X					X	X	X	X	X	X	X
One of																									
CO600	O	X	O	X	O	O	X	X	X	X	X	X	O	O	X	X	X	X	O	X	X	X	O	X	X
CO620	O	X	O	X	O	O	X	X	X	X	X	O	O	O	X	X	X	X	O		X	X	O	X	O
CO650	X	X	X	X			X	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X
Options																									
CO528		X		X	X		X			X			X		X						X	X		X	
CO653		X						X			X				X	X		X			X	X	X	X	
CO654		X		X	X		X			X	X		X		X							X		X	
CO656	X	X	X		X		X				X		X		X							X		X	
CO636		X		X			X	X							X						X	X	X		X
CO637		X		X	X		X						X		X	X						X		X	
CO639		X					X	X	X	X	X	X	X		X	X	X	X			X	X		X	
CO641	X	X	X	X			X				X		X		X			X			X	X	X	X	
CO643			X	X			X			X	X	X		X							X				X
CO645	X	X	X	X			X	X	X	X	X	X		X		X	X	X		X	X	X	X	X	X
CO646								X												X	X	X		X	X
CO831	X	X	X	X			X	X	X			X			X	X	X	X			X	X		X	
CO832		X		X	X		X		X	X	X		X			X	X	X				X		X	
CB612													X								X	X			X

Notes:

- Learning outcomes for non-CO modules are indicative, as specifications for such modules have not necessarily been written directly in terms of the learning outcomes for CO programmes.
- Learning outcomes are marked as O for project modules then these are dependent on the chosen project topic.
- LOs: A13, B8 and C13 only relate to the Year in Industry version of this degree programme.
- Module CO790 is only taken by students taking the year in industry version of this degree programme.

Learning Outcomes Matrix for CS(Consultancy) Programmes

CS (Consultancy)	A1	A2	A3	A4	A5	A13	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C13	D1	D2	D3	D4	D5	D6
Required																									
CO320		X		X			X					X	X		X	X		X				X		X	
CO322													X										X	X	
CO324	X	X	X																			X	X		
CO334	X	X	X					X				X									X	X	X		X
CO325													X										X	X	
CO323		X		X			X			X		X			X	X	X	X				X		X	
CO328			X	X			X		X			X			X	X	X	X		X		X		X	
CO520		X		X			X				X	X	X		X	X									
CO510		X	X	X			X	X	X	X	X	X			X	X	X	X		X	X	X	X	X	X
CO518		X		X	X		X		X	X			X		X	X							X	X	
CO519				X	X		X		X	X	X		X		X			X					X	X	
CO539		X	X	X			X		X	X	X				X	X	X	X				X		X	
CO545		X	X	X	X		X				X		X		X							X		X	
CO527	X	X									X				X	X		X				X	X		X
CO532		X		X	X		X	X	X						X	X	X					X	X		X
CB680																					X	X		X	
CO650	X	X	X	X			X	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X
Direct Entry																									
CO523		X	X	X	X		X				X	X	X		X	X		X				X		X	
Year in industry																									
CO790						X								X					X	X	X	X	X	X	X
Options																									
CO528		X		X	X		X			X			X		X							X	X		X
CO653		X						X			X				X	X		X				X	X	X	X
CO654		X		X	X		X			X	X		X		X							X		X	
CO656	X	X	X		X		X				X		X		X							X		X	
CO633			X	X			X		X	X	X				X			X				X	X	X	X
CO634	X	X	X						X	X	X	X			X	X						X	X	X	
CO636		X		X			X	X							X						X	X	X		X
CO637		X		X	X		X						X		X	X						X		X	
CO639		X					X	X	X	X	X	X	X		X	X	X	X				X	X		X
CO641	X	X	X	X			X				X		X		X			X				X	X	X	X
CO643			X	X			X			X	X	X		X								X			X
CO645	X	X	X	X			X	X	X	X	X	X		X		X	X	X		X	X	X	X	X	X
CO646								X													X	X	X		X
CO831	X	X	X	X			X	X	X			X			X	X	X	X			X	X		X	
CO832		X		X	X		X		X	X	X		X			X	X	X				X		X	
CB612													X								X	X			X

Notes:

- Learning outcomes for non-CO modules are indicative, as specifications for such modules have not necessarily been written directly in terms of the learning outcomes for CO programmes.
- Learning outcomes are marked as O for project modules then these are dependent on the chosen project topic.
- LOs: A13, B8 and C13 only relate to the Year in Industry version of this degree programme.
- Module CO790 is only taken by students taking the year in industry version of this degree programme.

