**Programme Specification**

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| **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 in the programme handbook. 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. |

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| **BSc Computer Science for Health****BSc Computer Science for Health with a Year in Industry** |

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| 1. **Awarding Institution/Body**
 | University of Kent |
| 1. **Teaching Institution**
 | University of Kent  |
| 1. **School responsible for management of the programme**
 | School of Computing |
| 1. **Teaching Site**
 | Medway |
| 1. **Mode of Delivery**
 | Full-time |
| 1. **Programme accredited by**
 | N/A |
| 1. **a) Final Award**
 | BSc (Hons)  |
| 7. **b) Alternative Exit Awards**  | BSc (non hons) Computer Science for Health; BSc (non hons) Computer Science for Health with a Year in IndustryDiploma in Computer Science for Health; Diploma in Computer Science for Health with a Year in Industry;Certificate in Computer Science for Health |
| 1. **Programme**
 | Computer Science for HealthComputer Science for Health with a Year in Industry |
| 1. **UCAS Code (or other code)**
 | I100 |
| 1. **Credits/ECTS Value**
 | 360 (180 ECTS) for 3 year programmes; 480 (240 ECTS) for the 4 year programmes that include a year in industry. |
| 1. **Study Level**
 | Undergraduate |
| 1. **Relevant QAA subject benchmarking group(s)**
 | Computing 2016 |
| 1. **Date of creation/revision**
 | May 2017/revised Jun 2017/revised FSO Dec 2017  |
| 1. **Intended Start Date of Delivery of this Programme**
 | September 2019 |

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| 1. **Educational Aims of the Programme**

The programme aims to: |
| * Provide a programme that will attract and meet the needs of both those contemplating a career in computing and those motivated primarily by an interest in Computer Science and its application to Health.
* Be compatible with widening participation in higher education by offering a wide variety of entry routes.
* Provide sound knowledge and systematic understanding of the principles of Computer Science.
* Familiarise students with the rapidly evolving landscape of technologies and applications of Computer Science to areas that include modern medicine, health and sport, data mining, data handling and health data analytics.
* Provide a fundamental computing skillset that will be of lasting value in a field that is constantly changing, and will act as a firm foundation for future learning.
* Offer a range of options to enable students to match their interests and study some of the many aspects of health-related computing in greater depth.
* Provide teaching which is informed by current research and scholarship in the field, which requires students to engage with aspects of work at the forefront of current research and development.
* Develop general critical, analytical and problem solving skills that can be applied as best practice in context of their specialisation.
* Prepare students for a successful and productive career as computer scientists and software engineers working to advance the application of computing in Health.

The 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, preferably also of relevance to their specialisation.
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| **16 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 statement for Computing 2016 (CO-SB). |

**A. Knowledge and Understanding of:**

1. Hardware: the major functional components of a computer system CO-SB3.3(iii).

2. Software: programming languages and practise; tools and packages; computer applications; structuring of data and information CO-SB3.3(iii).

3. Communication and interaction: basic computer communication network concepts; communication between computers and people; the control and operation of computers CO SB3.3(iii).

4. Practise: problem identification and analysis; design development, testing and evaluation. CO-SB3.3(iii).

6. An understanding of the scientific method and its applications to problem solving in this area. CO SB3.3(ii).

Outcomes specific to:

Year in Industry programmes

13. Aspects of the core subject areas from the perspective of a commercial or industrial organisation.

Outcomes specific to CS for Health:

1. Domain specific knowledge in Health: Understand the landscape of modern medicine, health and sport, and the potential for applications of Computer Science in these contexts.
2. Computer applications with emphasis on software for modern medicine, health and sport; structuring of data and information for Health applications.
3. Communication between computers and health service users and practitioners; the control and operation of computers and mobile platforms for Health.

Note: LOs numbered A5, A7-A12 and A14-A15 are intentionally unused and relate to other current or former degree programmes belonging to the school.

**Skills and Other Attributes**

**B. Intellectual Skills:**

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 SB3.3(iv).
2. Reflection and communication: present succinctly to a range of audiences rational and reasoned arguments. CO SB3.5(iv).
3. Requirements: Identify and analyse criteria and specifications appropriate to specific problems and plan strategies for their solution. CO SB3.3(v).
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 SB3.3(vi).
5. Methods and tools: Deploy appropriate theory, practices, and tools for the specification, design, implementation, and evaluation of computer-based systems. CO SB3.3(vii).
6. Professional responsibility: Recognise and be guided by the professional, economic, social, environmental, moral and ethical issues involved in the sustainable exploitation of computer technology. CO SB3.3(viii).
7. Computational thinking: demonstrate a basic analytical ability and its relevance to everyday life. CO SB3.3(i).

Outcomes specific to:

Year in Industry programmes

1. Apply some of the intellectual skills specified for the programme from the perspective of a commercial or industrial organisation.

**C. Subject-specific Skills:**

1. Design and implementation: Specify, design, and implement reliable secure and usable computer-based systems. CO-SB3.4(i).
2. Evaluation: Evaluate systems in terms of general quality attributes and possible trade-offs presented within the given problem. CO SB3.4(ii).
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.
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 SB3.4(v) .
5. The ability to plan and manage projects to deliver computing systems within the constraints of requirements, timescale and budget. CO-SB3.4(iii).
6. The ability to recognise any risks and safety aspects that may be involved in the deployment of computing systems within a given context. CO SB3.4(iv).
7. The ability to critically evaluate and analyse complex problems, argument and evidence, including those with incomplete information, and devise appropriate computing solutions, within the constraints of a budget. CO-SB3.4(vi).

Outcomes specific to:

Year in Industry programmes

13. Apply some of the subject-specific skills specified for the programme from the perspective of a commercial or industrial organisation.

Outcomes specific to CS for Health:

15. Understand, design, and evaluate software for Health, including fixed and mobile software for social, medical and lifestyle interaction with humans.

16. Create new software and applications for Health, showing an understanding and appreciation for the risks and benefits of software applications in such a human-centric field.

Note: LOs numbered C8-C12 and C14 are intentionally unused and relate to other current or former degree programmes belonging to the school.

**D. Transferable Skills:**

1. Teamwork: Be able to work effectively as a member of a development team. CO SB3.5(v).
2. Interaction reflection and Communication: Make succinct presentations to a range of audiences about technical problems and their solutions. CO SB3.5(iv).
3. Information Technology: Effective use of general IT facilities; information retrieval skills
4. Intellectual skills: critical thinking; making a case; numeracy and literacy; information literacy. The ability to construct well-argued and grammatically correct documents. The ability to locate and retrieve relevant ideas, and ensure these are correctly and accurately referenced and attributed. CO SB3.5(ii).
5. Self-management: Managing one’s own learning and development, including time management and organisational skills CO SB3.5(iii).
6. Professional Development: Appreciating the need for continuing professional development in recognition of the need for lifelong learning CO SB3.5(i).
7. Contextual awareness: the ability to understand and meet the needs of individuals, business and the community, and to understand how workplaces and organisations are governed. CO-SB3.5(vi).
8. Sustainability: recognising factors in environmental and societal contexts relating to the opportunities and challenges created by computing systems across a range of human activities. CO-SB3.5(vii).

**Teaching/learning and assessment methods and strategies used to enable the programme learning outcomes to be achieved and demonstrated**

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 Stage 1 when there is an emphasis on supporting students via supervised classes and laboratory sessions. These core components are built on in Stage 2 with more emphasis on self-directed study via directed reading and research. In Stage 3 the project provides an opportunity for independent and/or group work under supervision from academic staff.

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.

Acquisition of computing specific skills is through lectures, classes and directed study. From the start of the programme of study, 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.

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| For more information on the skills developed by individual modules and on the specific learning outcomes associated with any Certificate, Diploma or BA/BSc non-honours awards relating to this programme of study, see the module mapping table, located at the end of this specification.  |

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| **17 Programme Structures and Requirements, Levels, Modules, Credits and Awards**This programme is 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. The programme is divided into three stages, each stage comprising modules to a total of 120 credits. Students must successfully complete each module in order to be awarded the specified number of credits for that module. One credit corresponds to approximately ten hours of 'learning time' (including all classes and all private study and research). Thus obtaining 120 credits in an academic year requires 1,200 hours of overall learning time. For further information on modules and credits refer to the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html> Each module and programme is designed to be at a specific level. For the descriptors of each of these levels, refer to Annex 2 of the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfoannex2.html>. To be eligible for the award of an honours degree students must obtain 360 credits (480 including Placement Year), at least 210 of which must be at Level 5 or above, including at least 90 credits at level 6 or above at Stage 3.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 in Computer Science for Health. 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 in Computer Science for Health. Students successfully completing Stage 2 of the programme and achieving 300 credits overall including at least 60 credits at level 6 or above in Stage 3 and meeting Credit Framework requirements will be eligible for the award of a BSc non-honours degree.Students successfully completing Stage 2 and also the placement and meeting credit framework requirements will be eligible for the award of the Diploma with a Year in Industry*.*For further information refer to the Credit Framework at <https://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html#exit-awards>. Compulsory modules are core to the programme and must be taken by all students studying the programme. Optional modules provide a choice of subject areas, from which students will select a stated number of modules. Where a student fails a module(s) due to illness or other mitigating circumstances, such failure may be condoned, subject to the requirements of the Credit Framework and provided that the student has achieved the **programme** learning outcomes. For further information refer to the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html>. Where a student fails a module(s), but has marks for such modules within 10 percentage points of the pass mark, the Board of Examiners may nevertheless award the credits for the module(s), subject to the requirements of the Credit Framework and provided that the student has achieved the **programme** learning outcomes. For further information refer to the Credit Framework. The following modules cannot be condoned or compensated:* CO600
* CO620
* CO650
* CO792
* CO793
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| **KV Code** | **Code** | **Title** | **Level** | **Credits** | **Term(s)** |
| **Stage 1** |
| **Compulsory Modules** |
| COMP3200 | CO320 | Introduction to Object-Oriented Programming | 4 | 15 | 1 or 2 |
| COMP3220 | CO322 | Foundations of Computing I | 4 | 15 | 1 or 2 |
| COMP3280 | CO328 | Human Computer Interaction | 4 | 15 | 1 or 2 |
| SPOR3460 | SS346 | Introduction to Human Physiology | 4 | 15 | 1 or 2 |
| COMP3340 | CO334 | People and Computing | 4 | 15 | 1 or 2 |
| COMP3230 | CO323 | Databases and the Web | 4 | 15 | 1 or 2 |
| COMP3360 | CO336 | Healthcare Computing | 4 | 15 | 1 or 2 |
| COMP5200 | CO520 | Further Object-Oriented Programming | 5 | 15 | 1 or 2 |
| **Stage 2** |
| **Compulsory Modules** |
| COMP3240 | CO324 | Computer Systems | 4 | 15 | 1 or 2 |
| COMP5390 | CO539 | Web Development | 5 | 15 | 1 or 2 |
| COMP5510 | CO551 | Data Structures and Algorithms | 5 | 15 | 1 or 2 |
| COMP5520 | CO552 | Agile Development & Software Security A | 5 | 15 | 1 or 2 |
| COMP5530 | CO553 | Agile Development & Software Security B | 5 | 15 | 1 or 2 |
| COMP5540 | CO554 | Computing Theory and Concurrent Programming | 5 | 15 | 1 or 2 |
| COMP5320 | CO532 | Database systems | 5 | 15 | 1 or 2 |
| COMP5550 | CO555 | Computer Science Topics in Health | 5 | 15 | 1 or 2 |
| **Stage S (4 year programmes only)** |
| **Required Modules** |
| COMP7920 |  CO792 | Industrial Placement Experience | 5 | 90 | All year |
| COMP7930 |  CO793 | Industrial Placement Report | 5 | 30 | All year |
| **Stage 3** |
| **Compulsory Modules** |
| Compulsory Modules Students must select one of the following projects: |
| COMP6000 |  CO600 | Group Project | 6 | 30 | 1 & 2 |
| COMP6200 |  CO620 | Research Project | 6 | 30 | 1 & 2 |
| **Compulsory Modules** |
| COMP8160 |  CO816 | eHealth | 7 | 15 | 1 or 2 |
| COMP6620 |  CO662 | Signal Analysis for Computing | 6 | 15 | 1 or 2 |
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| **Optional Modules** Students must select the remaining 45 credits from the Computing Stage 3 optional modules |

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| **18 Work-Based Learning**Disability Statement: Where disabled students are due to undertake a work placement as part of this programme of study, a representative of the University will meet with the work placement provider in advance to ensure the provision of anticipatory and reasonable adjustments in line with legal requirements. |
| Where relevant to the programme of study, provide details of any work-based learning element, inclusive of employer details, delivery, assessment and support for students.  |
| * Industrial placement consists of Modules CO792 (90 credits) and CO793 (30 credits)
* The onus is on student to secure placement, with assistance from the School
* The School Industrial Placement Office oversees the placements and one of the placement officers will typically visit the students during their placement.
* If for any reason the industrial placement cannot be undertaken the student can transfer to the three-year version of their programme.
* The placement is assessment via CO792 (which is pass/fail) by way of a portfolio and log book plus a performance evaluation by the industrial supervisor. The assessment is also assessed via CO793 by way of a placement report.
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| **19 Support for Students and their Learning** |
| * School and University induction programme
* Programme/module handbooks
* Library services <http://www.kent.ac.uk/library/>
* Student Support <http://www.kent.ac.uk/studentsupport/>
* Student Wellbeing [www.kent.ac.uk/studentwellbeing/](http://www.kent.ac.uk/studentwellbeing/)
* Centre for English and World Languages <http://www.kent.ac.uk/cewl/index.html>
* Student Learning Advisory Service <http://www.kent.ac.uk/uelt/about/slas.html>
* PASS system <https://www.kent.ac.uk/teaching/qa/codes/taught/annexg.html>
* Academic Adviser system <https://www.kent.ac.uk/teaching/advisers/index.html>
* Kent Union [www.kentunion.co.uk/](http://www.kentunion.co.uk/)
* Careers and Employability Services [www.kent.ac.uk/ces/](http://www.kent.ac.uk/ces/)
* Counselling Service https://www.kent.ac.uk/studentwellbeing/counselling/
* Information Services (computing and library services) [www.kent.ac.uk/is/](http://www.kent.ac.uk/is/)
* Undergraduate student representation at School, Faculty and Institutional levels
* International Recruitment Office <https://www.kent.ac.uk/internationalstudent/>; International Partnerships Office <https://www.kent.ac.uk/global/partnerships/>
* Medical Centre <https://www.kent.ac.uk/studentwellbeing/medicalcentre.html>

School-specific information about the support available* Introductory talks at the start of each teaching term of Stages 2 and 3
* An extensive School website containing
* information on all Computer Science modules including where appropriate
	+ Module Learning Outcomes
	+ module specification
	+ details of any classes
	+ module assessment
	+ study material
	+ anonymous question pages
* past examination papers
* staff/student liaison information including
	+ details of student representatives
	+ minutes of meetings
* Administrative support via the Administration Office
* Industrial placement support via an Industrial Placement co-ordinator and visits by academic staff
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| **20 Entry Profile**The minimum age to study a degree programme at the university is normally at least 17 years old by 20 September in the year the programme begins. There is no upper age limit. |
| 20.1 **Entry Route**For current information, please refer to the University prospectus |
| **A level** ABB **GCSE** Mathematics grade C **Access to HE Diploma** The University will not necessarily make conditional offers to all Access candidates but will continue to assess them on an individual basis. If we make you an offer, you will need to obtain/pass the overall Access to Higher Education Diploma and may also be required to obtain a proportion of the total level 3 credits and/or credits in particular subjects at merit grade or above. **BTEC Level 3 Extended Diploma (formerly BTEC National Diploma)** The University will consider applicants holding BTEC National Diploma and Extended National Diploma Qualifications (QCF; NQF; OCR) on a case-by-case basis. Please contact us for further advice on your individual circumstances. **International Baccalaureate** 34 points overall or 16 points at HL including Mathematics 5 at HL or SL, or Mathematics Studies 6 at SL |
| 20.2 **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
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| 20.3 **Personal Profile** |
| * 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
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| 21 **Methods for Evaluating and Enhancing the Quality and Standards of Teaching and Learning** |
| 21.1 **Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards** |
| * Student module evaluations
* Annual programme and module monitoring reports <http://www.kent.ac.uk/teaching/qa/codes/taught/annexe.html>
* External Examiners system <http://www.kent.ac.uk/teaching/qa/codes/taught/annexk.html>
* Periodic programme review <http://www.kent.ac.uk/teaching/qa/codes/taught/annexf.html>
* Annual staff appraisal
* Peer observation
* Quality Assurance Framework <http://www.kent.ac.uk/teaching/qa/codes/index.html>
* QAA Higher Education Review <http://www.qaa.ac.uk/InstitutionReports/types-of-review/higher-education-review/Pages/default.aspx>

School-specific information: * Student representation on key committees
* External accreditation of programmes
* Active staff development programme
* Continuous monitoring of student progress and attendance
* School 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
* School Director of Education
* Module teams
* Programme Teams
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| 21.2 **Committees with responsibility for monitoring and evaluating quality and standards** |
| * Staff-Student Liaison Committee
* School Education Committee
* Faculty Education Committee
* Faculty Board
* Education Board
* Board of Examiners
 |
| 21.3 **Mechanisms for gaining student feedback on the quality of teaching and their learning experience** |
| * Student module evaluations
* Staff-Student Liaison Committee
* Student rep system (School, Faculty and Institutional level)
* Annual NSS

School-specific mechanisms used to obtain student feedback* + University Internal Student Surveys
	+ Discussions with Academic Adviser
	+ 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 School committees
	+ Student representation on faculty committees
	+ Student representation on university committees
 |
| 21.4 **Staff Development priorities include:** |
| * PGCHE requirements
* HEA (associate) fellowship membership
* Annual appraisals
* Institutional Level Staff Development Programme
* Academic Practice Provision (PGCHE, other development opportunities)
* Professional body membership and requirements
* Programme team meetings
* Research seminars
* Conferences
* Study leave
* Equality, Diversity and Inclusivity (EDI) awareness

School-specific staff development opportunities* + Staff training of various kinds including appraiser training, interview training, meeting skills etc.
	+ Research group support for research-led teaching
	+ 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
	+ 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
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| 22 **Indicators of Quality and Standards** |
| * Results of periodic programme review March 2012
* QAA Higher Education Review 2015
* Annual External Examiner reports
* Annual programme and module monitoring reports

School-specific Indicators* + Degree results and graduate recruitment statistics
	+ Independent review of the quality of educational provision in the School by the Higher Education Funding Council subject review process achieving an excellent grading.
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| 22.1 **The following reference points were used in creating these specifications:** |
| * QAA UK Quality Code for Higher Education http://www.qaa.ac.uk/assuring-standards-and-quality
* QAA Benchmarking statement/s for Computing (2016)
* School and Faculty plan
* University Plan <https://www.kent.ac.uk/about/plan/> and Learning and Teaching Strategies https://www.kent.ac.uk/uelt/strategies/lta.html
* Staff research activities
* Kent Inclusive Practices (<https://www.kent.ac.uk/studentsupport/accessibility/inclusive-practice.html>)

School-specific reference points* Requirements of the IET
* Association of Computing Machinery, CS2013: Computer Science Curricula 2013.
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| 23 **Inclusive Programme Design**  |
| The School recognises and has embedded the expectations of current equality legislation, by ensuring that the programme is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services. |

Learning Outcomes Matrix CS for Health Programmes

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| CS-EH | A1 | A2 | A3 | A4 | A6 | A13 | A16 | A17 | A18 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C13 | C15 | C16 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 |
| **Required** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO320 |  | X |  | X |  |  |  |  |  | X |  |  |  |  | X | X |  | X | X |  | X |  |  |  |  |  |  |  |  | X |  | X |  |  |  |
| CO322 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | X |  |  |  |
| CO323 |  | X |  | X |  |  |  |  |  | X |  |  | X |  | X |  |  | X | X | X | X |  |  |  |  |  |  |  |  | X |  | X |  |  |  |
| CO324 | X | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | X |  |  |  |  | X |
| CO328 |  |  | X | X |  |  |  |  |  | X |  | X |  |  | X |  |  | X | X | X | X |  |  |  |  |  |  | X |  | X |  | X |  |  |  |
| CO334 | X | X | X |  |  |  |  |  |  |  | X |  |  |  | X |  |  |  |  |  |  |  | X |  |  |  |  | X | X | X |  | X | X | X | X |
| CO336CO336 | X | X | X |  |  |  | X | X |  |  | X | X |  | X |  |  |  |  | X | X |  |  | X | X |  | X |  | X | X | X | X | X |  | X | X |
| CO552 |  | X |  | X | X |  |  |  |  |  |  |  | X |  | X |  |  |  |  | X | X | X |  | X |  |  |  |  |  |  |  |  | X | X |  |
| CO-CTH | X | X | X |  |  |  | X | X | X |  | X |  |  | X | X | X |  |  | X | X |  |  | X |  |  | X | X |  |  | X | X |  | X | X |  |
| CO551 |  | X |  | X |  |  |  |  |  | X |  | X |  | X |  |  |  | X | X |  |  |  |  | X |  |  |  |  |  | X | X | X |  |  |  |
| CO554554 |  | 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 |  | X |  |  |  |
| CO532 |  | X |  | X |  |  |  |  |  | X | X | X |  |  |  |  |  | X | X | X |  |  |  |  |  |  |  |  | X | X |  | X |  |  |  |
| CO520 |  | X |  | X | X |  |  |  |  | X |  |  |  | X | X | X |  | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SS346 |  |  |  |  | X |  | X |  |  | X | X |  | X | X | X |  |  |  | X |  | X |  | X |  |  | X |  |  |  |  | X | X | X | X |  |
| CO816 |  |  |  | X |  |  | X | X | X | X | X | X |  | X | X | X |  | X | X | X |  |  |  |  |  | X | X |  | X | X |  | X |  |  |  |
| CO662 | X | X | X |  |  |  | X |  |  |  | X |  |  | X |  |  |  |  |  | X | X |  |  |  |  |  | X |  | X | X |  | X |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **One of** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO600 | O | X | O | X | X |  |  |  |  | O | X | X | X | X | X | O |  | X | X | X | X | X | O | X |  |  |  | X | X | X | O | X | X | X |  |
| CO620 | O | X | O | X | X |  |  |  |  | O | X | X | X | X | O | O |  | X | X | X | X | X | O | X |  |  |  |  | X | X | O | X | O | X |  |
| **Year in industry** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CO792 |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |  |  | X | X | X | X | X | X |  |  |
| CO793 |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |  |  | X | X | 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.
* Where 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.
* Modules CO792 and CO793 are only taken by students taking the year in industry version of this degree programme.

Optional Modules cover all programme learning outcomes irrespective of the combination taken.