Changes to previous information

During the global COVID-19 pandemic, we prioritised the health, wellbeing and safety of our students and staff.

As we start the new academic year, your health, wellbeing and safety remains our top priority. This means when we return to our campuses and buildings in September 2020 social distancing and other health and safety measures will be in place. This is to help keep you, and others around you, safe. We will respond to the requirements of vulnerable students regarding their personal safety on an individual basis.

We remain committed to delivering an outstanding education and student experience both on campus and online. Like most universities, we'll be providing a mix of on-site face-to-face and digital learning and teaching. The exact mix will vary between courses and course modules taking into account teaching requirements and other considerations such as meeting the safety of vulnerable staff.

It is important to emphasise that a face-to-face, on-site experience will be delivered within the Government and Public Health England guidance and providing there are no serious unforeseeable public health issues that result in the Government introducing further lockdown measures.

Our response to the pandemic means we may have made changes to your course. This is to take account of these important health and safety measures.

We ask you to read the information provided about course changes carefully. We detail what we include in our online prospectus and explain what has changed.

You should read our statement of changes alongside any information provided in videos, at open days or in other promotional materials. This is because the information may also have been affected by the changes we had to make. We are providing this information so you can make an informed choice about whether the course remains suitable for you.

When you register for your course, you will be asked to confirm you have read about our changes and you agree to them. It means that by choosing to continue with your application, and register with us, you accept these changes and are happy to study your course with us.

We really look forward to seeing you in the next academic year. In the meantime, if you want to find out more about University life from this September, and being part of our supportive and welcoming community, please visit our September 2020 web pages.

	Current published course related information	
Course title	Computer Science	
Award level	BSc– Single	
How do you want to study?		
Start Date	Sept 2020	
Modes of study	Full-time Part-time Full-time with year in industry	
Duration	3 years full-time 6 years part-time 4 years full-time with year in industry	
UCAS code	I104 I105 (with year in industry)	
Location	Canterbury	
Partner institution	N/A	
Available with a Foundation Year	Yes	
Overview		
	As the use of the internet, 'big data', simulation, and automation continues to grow, so does the need for computing scientists who can provide real solutions to real problems. This course has been designed so you can meet the demands of high-performance computing in industry. You will learn software development, machine architecture, problem modelling and parallel computing – among other things. The main emphasis of this degree is on the development of advanced software and the use of cutting-edge ideas to enable you to work with data on a massive scale – something employers are increasingly demanding.	
Why study Computer Science?		
	N/A	Computer Science is an ever expanding field of study with great opportunities for employment, further study and or research in many, potentially inter-

disciplinary fields. This course main emphasis is on the development of software using high performance computing and cutting edge concepts to enable an intelligent understanding of data on a massive scale using high performance computing. The foundation year provides fundamental learning to support a degree in computer science.

This course will enable you to develop specialist skills and in depth knowledge, so that you can play a key role as a computing professional

The course learning is adhering to [World Health Organisation (WHO)](#) and [UK GOV Coronavirus guidance](#) to ensure a safe learning and working environment during COVID19 endemic. The course will consist of blend of on and off campus practical learning in computing laboratories and off-campus on-line theoretical and practical learning. The off-campus hands on practical learning are being designed to use open source, student licensed software (which we have invested in) and cloud-based software resources so we can support your learning in your home. The on and off campus and on-line practical learning are being designed to help you develop practical skills, also an enquiring mind and demonstrating your technical skills and creativity.

On-line learning will be provided by virtual learning environment Blackboard and appropriate specialist software tools that support certain module areas, for example computer programming using MS Visual Studio Live.

Read less

| | | The on and off campus on-line practical elements of the course we will help you develop on and off campus will prepare you to enter a career in computer hardware or software, you'll gain a solid grounding in computing and will learn skills to support you with your degree and beyond.

Following the CDIO - conceive, design, implement and operate - model of learning, you'll cover all the elements of computing projects from conception, through design and implementation to final operation and review.

The range of subjects covered in this degree has been designed to allow you to consider roles in other aspects of computing such as system administration, database administration, and software development. |
| --- | --- | --- |

Entry requirements	A typical offer would be 96-120 UCAS Tariff points. Requirement for Numerate A level or equivalent as part of this – E.g. Maths, Physics, Computer Science. More entry requirement details. This degree is also available with a Foundation Year for those who do not meet the entry requirements above. More information about entry requirements.	
About the course		
Years 1-3	You will explore areas including: computational mathematics, high performance computing, machine learning and advanced programming. You will develop programming capability and a deeper understanding of the specialist mathematics used in large-scale parallel systems and artificial intelligence. You will also look at some of the ethical issues in computing and the skills sets required in the workplace with a view to developing these	All through the course, you'll experience through hands-on learning from on and off campus and on-line learning. This will develop your practical agile problem-solving approach to create computing science solutions to problems. You will undertake group projects, typically sourced from industry or akin to problems in industry. Your groupwork will be supported through the use on-line tools and on-line project management solutions. You'll also develop skills enabling you to: • work effectively and supportively in diverse and inclusive groups • communicate effectively in groups and one to one • apply project management to group-work • apply principles of commercial management and consideration of wider issues. In Year 1 you will develop programming capability and a deeper understanding of the specialist mathematics used in large-scale parallel systems and Artificial Intelligence. You will also look at some of the ethical issues in computing and

the skills sets required in the workplace with a view to developing these.

You will explore areas including: computational mathematics, high performance computing, machine learning and advanced programming. You will develop programming capability and a deeper understanding of the specialist mathematics used in large-scale parallel systems and artificial intelligence. You will also look at some of the ethical issues in computing and the skills sets required in the workplace with a view to developing these.

You will have the opportunity to take in your third year, providing you meet the requirements. If you can identify and secure a placement opportunity, with the support from the computing team. A placement will provide you with the further opportunity to develop your skills as a practicing computing professional, a personal development plan and evidence of your abilities for your future employers.

Module information

- Please note that the list of optional modules and their availability may be subject to change. We continually review and where appropriate, revise the range of modules on offer to reflect changes in the subject and ensure the best student experience. Modules will vary when studied in combination with another subject.

Core year 1

Introduction to C#
Core module - (20 Credits)

This module introduces you to C# programming language and the Visual Studio Integrated Development

Environment (IDE). This is an initial module in computer programming and will assume no prior knowledge of programming. This module provides support for the Design and Implement elements of the CDIO module.

	Mathematics for Computer Science Core module - (20 Credits) This module aims to provide a foundation in applied mathematics covering the areas of: graph theory, probability theory, linear algebra and pure mathematics such as calculus and number theory. The first section of the module will examine a range of standard topics as follows: basic statistics; sequences and series; set theory; difference equations, calculus; complex numbers and graph theory. The second part of teaching will examine more pervasive ideas through for example the application of probability theory, linear algebra and special topics such as game theory which combines a range of mathematical concepts.	
	Fundamentals of Computer Systems Core module - (20 Credits) This module aims to provide a foundation in computer systems and related topics, the areas of: number systems, hardware, digital systems and digital communication. You will use software tools (e.g. Microcontroller based simulator, logic gate simulators, CPU simulators, Network simulators, etc.) with supplementary tutorials and hands-on demonstrations to understand the underpinning concepts.	
	Application Development Core module - (20 Credits) On this module you will increase your capability to develop simple C# solutions to problem situations. This will cover more complex programming concepts as well as concepts of Graphical User Interface development and design and linking C# systems to file store and database systems.	
	Ethics, Professionalism and Employability in Computing Core module - (20 Credits) This module aims to give a good understanding of ethical, professional and employability issues you will encounter when embarking on a career in computing. The module will focus on the kind of roles available to computer professionals and	

	discuss the choices required, both in general and with regard to the degree modules that might best guide you into a particular career. You will have the opportunity to research and explore the knowledge required for your chosen career and be encouraged to discuss the ethical and professional issues relating to these areas.	
	Software Lifecycle Group Development Project Core module - (20 Credits) To develop your understanding of the fundamental concepts of software engineering you will work through a project in teams to develop a piece of software. You will work through the software life-cycle tasks to developing a computer-based solution to meet specific user requirements through the development of a simple system. You will also develop your understanding of what is required for good team formation and operation.	
Optional year 1		
	N/A	
Core year 2		
	Object-oriented Programming Core module - (20 Credits) Object oriented programming continues the software programming stream from year 1 by looking at a way of thinking about problems and development of solutions – using the class and object model. Continuing the use of the main programming language from year 1 (typically C#) the module deepens your knowledge of how to use the power of this development language. You will also consider the concepts of the ethics of untested software and Intellectual property rights in the software industry and how this may affect their own software development careers.	
	Software Engineering Core module - (20 Credits) This module provides you with an opportunity to understand the basic methodologies, tools and techniques	

	involved in creating comparatively small software systems. The module aims to provide you with the ability to effectively use one of the industry used software development frameworks such as Visual Studio Team Services (VSTS) and its embedded tools to create a full application starting with a scenario of a small project idea and ending with full deployment of a solution application.	
	Database Enhancement Group Project Core module - (20 Credits) This project module aims to give you practical appreciation of the fundamental issues involved in designing, implementing and testing a small relational database application in a multi-user environment using an industry standard database management system. You will be taking an existing database and making improvements to this while understanding the modelling concepts and theory to understand database systems.	
	Web Development Projects Core module - (20 Credits) This module aims to provide you with the theoretical knowledge and practical skills to understand and construct interactive websites. The focus will be on client-side and server-side design and implementation enabling you to appreciate the role of various network architectures and system configurations. This module provides support for all elements of the CDIO model.	
	Networking and Operating Systems Core module - (20 Credits) This module introduces the basic principles of operating systems and you will undertake practical exercises on basic administrative tasks. You will also be introduced to the fundamental aspects of Computer Networks. Key aspects such as the design, construction and operation of Local and Wide Area Networks, and the layered protocol architecture are covered. The module aims to reinforce the taught material using physical equipment and software tools in a laboratory environment.	

	Artificial Intelligence Core module - (20 Credits) This module presents Artificial Intelligence (AI) as a coherent body of ideas and methods connected to underlying theories about intelligent computer systems. You will explore this through problem-solving paradigms, logic and theorem proving, search and control methods and machine learning.	
Optional year 2		
	Optional Year in Industry The year in industry allows you to develop your knowledge and skills in a business or industrial setting. This allows you to build up the practical skills desired by employers and to demonstrate your capabilities on your CV.	
Core year 3		
	Individual Project - Part A Core module - (20 Credits) The individual project you with an opportunity to individually manage, analyse, design, program and test a good quality, reliable and maintainable significantly sized system using a specified software development life cycle/development methodology, again, of your own choice in a timely fashion. You will work largely on your own, with guidance and some input from a supervising member of academic staff. The module requires the development of a significant sized software artefact and production of a formal report describing and critically appraising its development. The software artefact must meet a clearly identified real-world need, ideally for, a clearly identified business/customer/organisation/end user.	
	Programming Frameworks and Languages Core module - (20 Credits) The module introduces special purpose frameworks used for special types of applications, such as web applications with special languages such as CodeIgniter for PHP. Selenium as Testing Framework will be	

	overviewed. JavaScript framework, Bootstrap, jQuery, ExpressJs, and NodeJS will also be introduced. Ruby on Rail will also be covered, where the Framework Rail is used for the development of web applications such as Twitter.	
	High Performance Computing Core module - (20 Credits) This module aims to convey a theoretical understanding of High Performance Computing (HPC) and its practical application to science and engineering. The HPC hardware architectures and the parallel programming techniques will be explored in detail and evaluated in the context of distributed systems and client server modelling. This will convey the importance of HPC architectures and parallel programming approaches when considering optimal solutions to complex problems.	
	Individual Project- Part B Core module - (20 Credits) You will continue your work on your Individual Project.	
	Advanced Operating Systems Core module - (20 Credits) This module provides a theoretical overview of the key concepts underpinning the design of modern operating systems. This theoretical knowledge will be used, critically analysed and applied to real-world uses of operating systems. Understanding of the underlying inter-process operation of operating systems will be looked at via shell scripting. The overall structure of an operating system will also be covered, i.e. the layered model, virtual machines, client-server, etc. The module will also consider the user's view of an operating system in terms of process control, file manipulation, device and information maintenance and the user interface/API.	
Optional year 3		
	Current Issues in Computing Optional module - (20 Credits)	

	This module examines a range of current issues within the field of computing and places them with a broader academic context providing a multi-disciplinary perspective to an otherwise specialised field of study. No prior knowledge of disciplines outside the field of computing is required, but a good understanding of computer related subjects is assumed.	
	Advanced Databases and Big Data Optional module - (20 Credits) This module uses the Conceive Design Implement Operate (CDIO) educational framework utilising software engineering fundamentals within the context of conceiving, designing, implementing and operating a complex valueadded real-world database system. The module follows on directly from the Year 2 Database Enhancement Group Project module. It aims to consolidate/extend the practical and analytical skills required to carry out more advanced logical/conceptual database design and explores alternative ways of modelling data. It also aims to keep you abreast of recent developments in the field; particularly in the storage and effective use structured Big Data.	

How you'll learn

Teaching	This degree uses the pioneering CDIO (Conceive, Design, Implement, Operate) education model – developed by the world-renowned Massachusetts Institute of Technology (MIT) in collaboration with business. This will help your natural creativity and thirst for problem-solving flourish as you learn and some of your teaching will be done via real world inspired projects. You will be taught through a combination of lectures, seminars and practical labs. You will typically have around 12 contact hours per week and are expected to also spend about 4 hours each week coordinating with team members on group activities. Labs will often emphasise working in small groups to enable you to discuss and develop your understanding of topics covered in lectures and place theory into practice. All programmes are informed by the University's Learning and Teaching Strategy 2015-2022.	**The course learning is adhering to [World Health Organisation (WHO)](#) and [UK GOV Coronavirus guidance](#) to ensure a safe learning and working environment during COVID19 endemic. The course will consist of blend of on and off campus practical learning in computing laboratories and off-campus on-line theoretical and practical learning. The off-campus hands on practical learning are being designed to use open source, student licensed software (which we have invested in) and cloud-based software resources so we can support your learning in your home. The on and off campus and on-line practical learning are being designed to help you develop practical skills, also an enquiring mind and demonstrating your technical skills and creativity.** **On-line learning will be provided by virtual learning environment Blackboard and appropriate specialist software tools that support certain module areas, for example computer programming using MS Visual Studio Live.** This degree uses the pioneering CDIO (Conceive, Design, Implement, Operate) education model – developed by the world-renowned Massachusetts Institute of Technology (MIT) in collaboration with business. This will help your natural creativity and thirst for problem-solving flourish as you learn and some of your teaching will be done via real-world inspired projects. You will be taught through a combination of lectures, seminars and practical labs. You will typically have around 50 contact hours per semester and are expected to also spend about 4 hours each week coordinating with

| | | team members on group activities. Labs will often emphasise working in small groups to enable you to discuss and develop your understanding of topics covered in lectures and place theory into practice.

You will also have regular scheduled meetings on-line and in person, in addition to the above contact hours, with an assigned academic personal tutor, which is your first point of contact for assistance to your undergraduates needs.

Your actual contact hours depend on the option modules you select.

All programmes are informed by the University's Learning and Teaching Strategy 2015-2022. |

Independent learning	When not attending timetabled sessions it is expected you will continue learning through self-study. Typically, this involves completing computer-based exercises, preparing for workshops and seminars, undertaking research in the library, working on projects, undertaking coursework assignments or preparing for class-tests and examinations and reading journal articles and books. Your module leader will direct you towards specific readings and/or activities to complete before class. For your final year individual study (dissertation), you will undertake independent research and will be assigned a supervisor; who will guide you through your first substantial and independent work through regular scheduled meetings	
Overall workload	Your overall workload typically consists of 12 contact hours and an additional 25 hours of independent learning. In addition, there may be field trips. For each 20-credit module, your study time will about 10 hours a week plus work on assessments or preparation for examinations. Assessments would normally be expected to take approximately 50 hours for an assignment worth 50% of a 20 credit module. A similar amount of preparation and revision time would be expected for an examination worth 50% of a 20 credit module.	Your overall workload typically consists of 50 per module of contact hours and an additional 150 hours of independent learning per semester. In addition, there may be field trips permitting World Health Organisation (WHO) and UK GOV Coronavirus guidance to ensure a safe learning and working environment for all parties. For each 20 credit module, your study time will about 10 hours a week plus work on assessments or preparation for examinations. Assessments would normally be expected to take approximately 50 hours for an assignment worth 50% of a 20 credit module. A similar amount of preparation and revision time would be expected for an examination worth 50% of a 20 credit module.
Academic input	The team consists of highly qualified academics. They have a range of expertise and experience. All our team members hold Doctoral or professional qualifications (e.g. Member of the British Computer Society or Eur. Ing.).	

	Find out more about the current teaching team. You should note members of the teaching team might change. Postgraduate students assist in some teaching and assessing some modules. However, experienced academics teach the majority of lectures and seminars.	

How you'll be assessed

	You will be assessed largely by coursework and project work, though some modules will also have examinations or class tests. Coursework is mainly practically-oriented with appropriate theoretical elements to ensure a wellrounded education. Assessments are generally individual, with group work in some modules where this matches the approaches used in industry.We use coursework assessment methods based on their suitability for specific modules. Formative feedback is provided formally in year one and during the year three individual study, and informally in workshops and seminars. We use coursework assessment methods based on their suitability for specific modules. Formative feedback is provided formally in year one and during the year three individual study, and informally in workshops and seminars. Methods of assessment used include production of software artefacts, project plans and diaries, essays, reports, 'investigation-based' presentations, oral presentations, individual studies/projects, poster presentations, online assessment, logs, examinations and time constrained assignments.	**Additional information** **Each academic year consists of a mix of modules that are assessed by coursework only, to modules that are assessed by examination and coursework.** **In class tests or Examinations maybe open-book, closed book style exam, on-line, or 24hr take home exam.** **Coursework may include, Engineering log book, Technical drawings, Wiki pages, blogs, pitches to industry, posters, leaflets, engineering manual, etc.**
Year 1	80% coursework	
Year 2	94% coursework	
Year 3	60% coursework	

Your future career

	On successful completion of this degree you will be strongly prepared for a role in system support and development. Having learned about development and maintenance of computer equipment and infrastructure, as well as supporting users of systems, you will be able to fit into a commercial IT environment. Our graduates are able to use their analytical and process development skills in other business domains. You will also have a strong grounding for further study on specialist Masters or	

	Research (MPhil/PhD) programmes. This degree will stand you in good stead to work towards professional qualifications with a number of commercial providers and also those of the British Computer Society.	
Fees		
UK/EU	Full-time £9,250	
	Part-time £4,625	
Overseas	Full-time £13,000	
	Part-time N/A	
UK/EU – Placement Year	Full-time £1,850	
	Part-time N/A	
Overseas – Placement Year	Full-time N/A	
	Part time N/A	

Course specific costs

Field Trips (including trips abroad and trips to museums, theatres, workshops etc)	We run several part-funded optional trips per year. Students are expected to pay a share of the overall cost: Typically in the order of £10-£20 per trip for UK regional trips. These are payable two weeks or more in advance of the trip. Fee will cover part of the travel and entry fee (if any). Food and drink are not included. We are hoping to run optional trips further afield in the UK or abroad. A larger student cost may be required for these. This will be indicated to students in advance. Wherever possible we will look to maximise the subsidy offered for the trip.	**There may be optional travel to off site locations and field trips will arranged in line with World Health Organisation (WHO) and UK GOV Coronavirus guidance This is to ensure a safe learning and working environment for all parties.** Students are expected to pay a share of the overall cost: Typically in the order of £10-£20 per trip for UK regional trips. These are payable two weeks or more in advance of the trip. Fee will cover part of the travel and entry fee (if any). Food and drink are not included. Also, possible opportunities to visit Industrial facilities on-line.
Travel and Accommodation costs for placements	Students who take the Placement module in Year 3 will be expected to self-fund all travel, accommodation if required, and subsistence costs.	
Text books	Some modules require a purchase of a text book. Text books in computing can cost between £10 and £70 per book. Other modules will use either free books or students will use a number of different books from the library. Students select which books to purchase. Books are highlighted in the first lecture few lectures of a module.	
Clothing/kit	Not required, unless required for placement, where the student will be responsible for these costs, unless essential Health and Safety requirements, where the placement partner organisation will bear the costs.	
Social Events	We do not charge for programme social events at the start and end of each year. Other social events may make a small charge of £15 or less to cover costs.	
Professional	N/A	

accreditation		
Industry links		
Other important information		
Date of publishing	29/06/2020	