Canterbury Christ Church University

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	Mathematics with Secondary Education	
Award level	BA – Single honours only	Please note that the award is a BSc (Hons), not a BA (Hons)
How do you want to study?		
Start Date	Sept 2020	
Modes of study	Full-time	
Duration	3 years full-time	
UCAS code	G1X1	
Location	Canterbury	
Partner institution	N/A	University of Kent at Canterbury
Available with a Foundation Year	No	
Overview		
	Mathematics is one of the most important subjects a child will learn in their journey through education. Our Mathematics with Secondary Education course is a direct route to qualified teacher status, meaning you could be in the classroom, helping children on their maths journeys within three years. The course teaching is split between experts at the University of Kent and Canterbury Christ Church University, meaning your student experience will be varied you'll reap the benefit of shared experience across two campuses in the same city. As well as being a route to teaching, a BSc Maths with Secondary Education could be your stepping stone into postgraduate study.	
Why study Mathematics with Secondary Education?		
	If you have a love of mathematics and a passion for teaching and working with young people, this course combines the two, developing your teaching skills alongside your mathematical studies. As well as developing a sound understanding of mathematics at an advanced level, you'll	

	gain significant teaching experience by carrying out placements in varied settings during Years 2 and 3. On successful completion of the course, Canterbury Christ Church University will recommend to the Department for Education that you are awarded Qualified Teacher Status. You'll study alongside other mathematics undergraduate students, spending your first year based at the University of Kent. In Year 2, you'll continue to be based at the University of Kent and will take some modules at Canterbury Christ Church University. In your final year, you'll be based at Canterbury Christ Church University where you'll study alongside other secondary mathematics student teachers, and you'll also complete an individual mathematics project at the University of Kent. This is the only joint programme in the country for BSc Mathematics with Secondary Education. It combines the benefits of studying mathematics at a university that is widely recognised for its innovative teaching and outstanding research (University of Kent) with learning to teach at an established, high quality provider of teacher education (Canterbury Christ Church University). By studying at two universities, you'll have access to a wealth of resources and expertise, which will help you reach your full potential as you embark on a career in teaching.	

Entry requirements	A typical offer would be 104-112 UCAS Tariff points. An A2 level at grade B in mathematics is required. GCSE English language and mathematics at grade C or above (or acceptable equivalents) are also required.	
About the course		
	The focus in Year 1 is developing a sound understanding of key aspects of mathematics, from methods and modelling to mathematical packages. From this solid foundation, you'll study mathematics at a more advanced level in Year 2 and you'll begin your mathematics education studies. This will include spending time in school supporting mathematics lessons as a teaching assistant and carrying out a four week placement in a mathematics department. In your final year, your focus will be on teaching mathematics and pedagogy, which includes two contrasting school placements. You'll also complete a mathematics dissertation enabling you to develop your subject knowledge in an area of mathematics that interests you. You will be expected at all times to demonstrate that you understand and uphold the professional code of conduct. This code of conduct is outlined in the Teaching Standards as published by the Department for Education.	Given the changing guidance to schools and educational settings we are keeping our approach to Initial Teacher Education placements under constant review. We constantly review the National Guidance for ITE, including that from the Department for Education, and ensure we comply with the required criteria and any statutory guidance. By following National Recommendations no trainee teacher studying at CCCU will be disadvantaged by the National or regional effects of COVID 19, on their route to Qualified Teacher Status (QTS). We currently intend to start all scheduled placement days for both year 2 and year 3 of the course as planned. If our school and college partners are in a position to support placements at this stage. If we need to adapt our approach to placements, for example, by undertaking some placements in a socially distanced manner, or by working remotely then we will do so, and support all student teachers with these modified approaches. We will keep you fully informed of what this means for your studies.
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		
	Statistics	

	Core module - (15 Credits) In this module, you'll explore some of the basic concepts of statistics, from data summarisation to the main methods of statistical inference. The techniques that you'll study can be used in their own right for simple statistical analyses, but they'll also serve as an important foundation for later, more advanced, modules. The statistical computing package R is used throughout the module for data analysis. The syllabus includes: an introduction to R and investigating data sets, sampling and sampling distributions, point and interval estimation, hypothesis testing, association between variables.	
	Algebraic Methods Core module - (15 Credits) In this module, you'll learn about algebraic methods which are central in modern mathematics and have found applications in many other sciences, and also in our everyday life. You will learn about the concept of proof in mathematics and the mathematical package, Maple, will be used to support your learning. The syllabus includes: logic, basic set theory, techniques of proof, functions, relations, systems of linear equations and Gaussian elimination, matrices and determinants.	
	Applications of Mathematics Core module - (15 Credits) In this module, you'll explore mathematical modelling and Newtonian mechanics. The mathematical package Maple will be used to support your learning. The syllabus includes: the modelling cycle, using examples such as Newton's law of cooling, population growth and simple reaction kinetics; the motion of a body, including aspects such as velocity and acceleration, Newton's laws of motion and projectile motion; orbital motion, including Newton's law of gravitation, planetary motion and Kepler's laws.	
	Linear Algebra Core module - (15 Credits) This module is a sequel to Algebraic Methods. You will explore the abstract theory of linear	

	spaces together with applications to matrix algebra and other areas of Mathematics (and its applications). Since linear spaces are of fundamental importance in almost every area of mathematics, the ideas and techniques discussed in this module lie at the heart of mathematics. The mathematical package Maple will be used to support your learning. The syllabus includes: vector spaces, linear transformations, eigenvalues and eigenvectors, diagonalization, orthogonality and applications using conics.	
	Mathematical Methods I Core module - (15 Credits) In this module, you'll explore widely used mathematical methods for functions of a single variable. The emphasis is on the practical use of these methods and the mathematical package Maple will be used to support your learning. The syllabus includes: complex numbers, polynomials, single variable calculus, scalar ordinary differential equations, curve sketching.	
	Mathematical Methods II Core module - (15 Credits) In this module, you'll explore widely mathematical methods for vectors and functions of two or more variables. The emphasis is on the practical use of these methods and the mathematical package Maple will be used to support your learning. The syllabus includes: vectors and vector algebra, including the differentiation of vector-valued functions of a scalar variable and vector fields (with everyday examples); partial differentiation, including maxima, minima and saddle points and Lagrange multipliers; integration in two dimensions using Cartesian and plane polar coordinates.	
	Probability Core module - (15 Credits) In this module, you'll study the basic concepts of probability. The techniques that you'll learn about can be used in their own right to solve simple problems, but also serve as an important foundation for later, more advanced, modules. The syllabus includes: concepts and axioms of probability, Bayes'	

	theorem, discrete and continuous random variables, expectation and variance, common distributions, probability and moment generating functions, weak law of large numbers, central limit theorem, transformation of a single continuous random variable, and joint distribution of discrete random variables.	
	Real Analysis I Core module - (15 Credits) In this module, you'll explore real analysis, i.e. the study of real numbers and real-valued functions of a real variable. The syllabus includes: real numbers, limits of sequences, completeness properties, continuity of functions, differentiation, Taylor's theorem and Taylor series.	
Optional year 1		
Core year 2		
	Applied Statistical Modelling I Core module - (15 Credits) Constructing suitable models for data is a key part of statistics. For example, we might want to model the yield of a chemical process in terms of the temperature and pressure of the process. Even if the temperature and pressure are fixed, there will be variation in the yield which motivates the use of a statistical model which includes a random component. In this module, you'll study how suitable models can be constructed, how to fit them to data and how suitable conclusions can be drawn. Both theoretical and practical aspects are covered, including the use of R.	
	Groups and Symmetries Core module - (15 Credits) The concept of symmetry is one of the most fruitful ideas through which mankind has tried to understand order and beauty in nature and art. In this module, you'll firstly explore the concept of symmetry in geometry and then look at links with the fundamental notion of a group in algebra. The outline syllabus includes: groups from geometry; permutations; basic group theory; action of groups and	

	applications to (i) isometries of regular polyhedra; (ii) counting colouring problems; matrix groups.	
	Introduction to Professional Placement Core module - (10 Credits) You will gain first-hand experience of mathematics education through placements in local schools. You will experience classes from Key Stages 3 and 4 and will be given a range of responsibilities linked to the role of a teaching assistant in the first placement (serial placement). In the second placement (block placement), you will consolidate your earlier learning and build a foundation for Year 3. You will be expected to critically reflect on different experiences you have had during these placements.	We currently intend to start all scheduled placement days for both year 2 and year 3 of the course as planned. If our school and college partners are in a position to support placements at this stage. If we need to adapt our approach to placements, for example, by undertaking some placements in a socially distanced manner, or by working remotely then we will do so, and support all student teachers with these modified approaches. We will keep you fully informed of what this means for your studies.
	Mathematics Learner and Teacher Core module - (20 Credits) You will draw on your prior experiences and skills and develops them by linking experiences and observations to theory. This will help to ensure you have the pedagogic knowledge, skills and understanding in preparation for introduction to school experience. You will develop your knowledge and understanding of the mathematics curriculum and the requirements and implications of National Curriculum documentation in order to inform your professional practice. You will be required to critically reflect on particular issues and an aspect of secondary mathematics pedagogy.	
Optional year 2		
	Lagrangian and Hamiltonian dynamics Optional module - (15 Credits) In this module, you'll gain a new perspective on Newton's familiar laws of motion. You will explore variational calculus with applications such as finding the paths of shortest distance. This will lead to the principle of least action from which we can derive Newton's law for conservative forces. You will also learn how symmetries lead to constants of motion and you will explore Hamilton's equations and discuss their underlying structures. The formalisms in this module form the basis of	As per our partner institution, this module will not run in the next academic year. It is being replaced with the following module option: **Numerical Methods** Optional module - (15 Credits) This module is an introduction to the methods, tools and ideas of numerical computation. In mathematics, one often encounters standard problems for which there are no easily obtainable explicit

	fundamental modern physics, from electromagnetism and general relativity, to the standard model of particle physics and string theory.	solutions, given by a closed formula. Examples might be the task of determining the value of a particular integral, finding the roots of a certain non-linear equation or approximating the solution of a given differential equation. Different methods are presented for solving such problems on a modern computer, together with their applicability and error analysis. A significant part of the module is devoted to programming these methods and running them in MATLAB.
	Linear Partial Differential Equations Optional module - (15 Credits) In this module, you will study linear partial differential equations, exploring their properties and discussing the physical interpretation of certain equations and their solutions. You will learn how to solve first order equations using the method of characteristics and second order equations using the method of separation of variables.	
	Mathematical Statistics Optional module - (15 Credits) This module is a pre-requisite for many of the other statistics modules but it can equally well be studied as a module in its own right. You will revise the idea of a probability distribution for one or more random variables and look at different methods to derive the distribution of a function of random variables. You'll then use these techniques to prove some of the results underpinning the hypothesis test and confidence interval calculations from earlier on in the course. These could be the t-test or the f-test. With these tools to hand, you'll look at how to fit models (probability distributions) to sets of data. The outline syllabus includes: joint, marginal and conditional distributions of discrete and continuous random variables; transformations of random variables; sampling distributions; point and interval estimation; properties of estimators; maximum likelihood; hypothesis testing; Neyman-Pearson lemma; maximum likelihood ratio test.	
	Ordinary Differential Equations	

	Optional module - (15 Credits) You will learn how to solve certain ordinary differential equations, like first order scalar equations, second order linear equations and systems of linear equations. The outline syllabus includes: first-order scalar ODEs; second-order scalar linear ODEs; existence and uniqueness of solutions; autonomous systems of two linear first-order ODEs.	
	Rings and Fields Optional module - (15 Credits) Can we square a circle? Can we trisect an angle? These two questions were studied by the ancient Greeks and were only solved in the 19th century using algebraic structures such as rings, fields and polynomials. In this module, you will be introduced to these ideas and concepts and shown how they generalise well known objects such as integers, rational numbers, prime numbers, etc. You'll then apply the theory to solve problems in geometry and number theory. This part of algebra has many applications in electronic communication, in particular in coding theory and cryptography.	
	Number Theory Optional module - (15 Credits) The security of our phone calls and bank transfers all rely on one area of mathematics: number theory. In this module, you'll be introduced to this wide area and you'll focus on solving Diophantine equations. In particular, there will be a focus on (without proof) Fermat's Last Theorem, arguably one of the most spectacular mathematical achievements of the twentieth century. The outline syllabus includes: modular arithmetic; prime numbers; introduction to cryptography; quadratic residues; Diophantine equations.	
Core year 3		
	Subject Pedagogy I & II Core module - (20 each Credits) These modules equip you to teach mathematics. You'll consider all key aspects of mathematics pedagogy and you'll be assessed through essays, critical reflection analysis and a presentation.	

	Research and Enquiry in Education Core module - (20 Credits) This module will help you to reflect on and improve your practice in the secondary age phase through research. You'll learn about a range of educational theories and philosophies to help you develop your own identity and practice as a reflective secondary teacher.	
	Professional Placement Core module - (20 Credits) This module encompasses your school placements. It is assessed through a collection of evidence against the Teachers' Standards.	We currently intend to start all scheduled placement days for both year 2 and year 3 of the course as planned. If our school and college partners are in a position to support placements at this stage. If we need to adapt our approach to placements, for example, by undertaking some placements in a socially distanced manner, or by working remotely then we will do so, and support all student teachers with these modified approaches. We will keep you fully informed of what this means for your studies.
	Preparing for Qualified Teacher Status Core module - (10 Credits) In this module, you will demonstrate your teaching and learning by developing a scheme of work, reflecting on your decisions and collating evidence against the Teachers' Standards.	
	Individual Project in Mathematics Core module - (30 Credits) You will explore and research a relevant topic in mathematics or statistics under the guidance of a supervisor. You will undertake self-directed study to produce a dissertation. The outline syllabus is determined by the topic of the project. Indicative mathematics titles include: knot theory; logistic map; totally non-negative matrices; signed permutations and the four colour theorem; generating functions; Latin squares; teaching further linear algebra; graph theory; exploring mathematics with origami; classical invariant theory; Zeta functions; foundations of the real numbers; Euler's formula; creative use of random numbers to teach statistics; the National Lottery; circular data.	

Optional year 3		

How you'll learn		
Teaching	The course typically consists of lectures, seminars, placements in school, self-study and tutorials. You will study 120 credits per year, with each module typically carrying 20 credits. Normally a 20 credit module carries a study time of 200 hours, typically made up of 50 hours of contact time and 150 hours of self-directed study that is completed in your own time. All courses are informed by the University's Learning and Teaching Strategy 2015-2022.	The following relates to the Canterbury Christ Church University elements of the course: As a result of the ongoing COVID-19 situation, we have redesigned our courses so that they can deliver a mix of face-to-face and digital learning. This will mean that courses can continue while following social distancing rules, even if further lockdowns occur. We have tried to do this in a way that is purposeful, thoughtful and driven by your likely needs. All lectures will be delivered digitally. Small interactive lectures may happen on campus (if suitable rooms are available). This means that as part of 'contact hours' for the course, you can expect to engage with a structured mix of: • on-site face-to-face teaching • 'live' digital teaching • other digital activities. We will take into account any guidance from local or national governments and the University, and will keep you informed of any changes that are necessary.
Independent study	When not attending lectures, seminars or other timetabled sessions, you will continue learning through self-study. Typically, this involves reading journal articles and books, undertaking research in the library, working on projects, and preparing for coursework assignments/examinations, workshops and seminars. Your module tutor will direct you towards specific readings and/or activities to complete before class.	
Academic input	You will be taught by experienced senior lecturers. All staff have extensive experience in teaching mathematics in a variety of secondary schools and have held a range of	

	different roles and responsibilities. Secondary mathematics teachers will also provide you with guidance and support as your mentor whilst you are on placement in school.	

How you'll be assessed		
	There are different methods of assessment used throughout the course, which include examinations and coursework. All placement modules are assessed via formal observation of teaching and assessment of evidence collated.	
Fees		
UK/EU	Full-time £9,250	
Overseas	Full-time £13,000	
Course specific costs		
Field Trips	For optional/elected trips the student may need to cover all or part of the cost of entrance/venue fees, travel, accommodation, board (food/drink), vaccinations or Visa and insurance costs (for international trips), if applicable	
Placements	Travel and food/drink. For international placements there may also be accommodation, vaccination, Visa and Insurance costs.	Although considerable effort is made by the Faculty to place students within reasonable vicinity of their address, it is often necessary for students to undertake substantial travel to placements, sometimes at considerable expense. In order to assist with this expenditure, the university will make a contribution towards students' travel expenses for the days they travel to school placements. This payment will be made to all students, whose return journey is greater than 10 miles, except for those who are placed on 'UNIBUSES or Taxis' (see separate University Supplied Transport Guidelines).
Text books	Most core texts are available in the library as a physical copy or available through the e-library. However, there may be some core texts that students wish to purchase or that are recommended for purchase by the programme.	
DBS Checks	There is a charge made for this process of £52	
Occupational Health Checks	Students may need to pay their GP to complete the appropriate section of the Occupational Health Questionnaire.	
Qualifications	These checks may incur costs (i.e. if a student	

Checks	needs to request a new certificate, pay for admin to process the checks, postage etc.)	
Travel to campuses and other teaching locations (particularly for use of specialist facilities)	The student will need to travel to University facilities, as well as any taught sessions in schools, swimming pools and other locations as timetabled. The dedicated mini buses which travel to Canterbury sites, such as Augustine House, Hall Placement and Polo Farm may be utilised in some instances and these are free of charge for students.	
Clothing / Kit	Students would need to purchase their own clothes for PE sessions including trainers and comfortable clothing.	
Learning Materials	Students may wish to purchase their own materials, such as teaching resources. There are materials available in sessions and for students to borrow from the University Library. However, if should wish to buy their own, they will need to cover the cost of this.	
Social Events & Conferences	Sometimes there are social events which students are invited to book on or attend to enhance their experience. These events can also be an opportunity for students to network with their peers and/or specialists in their field. These can be held on campus or be held and run externally- either in the UK or Internationally. For optional events, students will be expected to pay for travel, accommodation (if applicable), and any entrance/booking fees.	
Other important information		
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