

## 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	Plant Science	
Award level	BSc - Single honours only	
How do you want to study?		
Start Date	Sept 2020	
Modes of study	Full-time Part-time	
Duration	3 years full-time 6 years part-time	
UCAS code	C200	
Location	Canterbury	
Partner institution	N/A	
Available with a Foundation Year	Yes	
Overview		
	<p>Recent reports from the UK government and independent scientific bodies have highlighted a shortage of graduates with knowledge and skills in plant science. This course gives you the chance to study the sought-after areas of soil science, plant pathology and plant physiology, in order to meet industry demand.</p> <p>Plant Science will immerse you in laboratory work, field trips and the chance to work with a range of employers, in order to help develop you into a highly employable graduate with transferable skills.</p> <p>You will also have the chance to gain further skills as part of our 'Added Value' programme and collaborate with biotech companies through the Life Sciences Industry Liaison Lab and advisory companies such as FAST Brogdale.</p>	<p>There will still be a focus on the development on practical skills in the laboratory but opportunities to work with employers will depend upon the current COVID-19 situation.</p> <p>Please note that the running of the optional 'Added Value' programmes will depend upon the situation with COVID-19.</p> <p>The practical week will be supported by supplementary online demonstrations of key laboratory techniques. In the event of further COVID 19 interruptions, further face to face contingency arrangements are planned to support student learning</p>
Why study Plant Science?		
	<p>The shortage of knowledgeable graduates and a resurgence in the horticultural industry and modern high-tech "sustainable" growing techniques means there are exciting career prospects for plant scientists. From working as a soil scientist or</p>	<p>The running of the optional Work Placement module at level 5 and summer internship positions will depend upon the COVID-19 situation in the summer of 2022.</p>

	<p>biotechnologist to becoming a plant journalist or horticultural manager, the employment opportunities are diverse.</p> <p>On this course, you'll gain a sound understanding of cell biology and you'll develop critical analysis skills. You'll go on to gain a deep understanding of taxonomy and classification, plant genetics and evolution, plant physiology and how this is influenced by the environment, and plant responses to external stimuli.</p> <p>You'll spend a significant amount of time building your knowledge and gaining hands-on experience in the labs. Here you'll be conducting experiments and studying plants at the molecular level while developing your analytical and research skills.</p> <p>You'll have the opportunity to complete a work placement where you'll be able to learn from and connect with experts in the sector. You'll have the opportunity to immerse yourself in plant science outside of the University by participating in an optional five-day field trip.</p>	
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Entry requirements	For entry to the 3 year full-time course (6 year part-time) candidates usually require between 88-112 UCAS tariff points, of which 32 UCAS tariff points or equivalent (e.g. GCE A level grade C or BTEC Subsidiary Diploma grade Merit) are in a science subject for example biology, chemistry.	
<b>About the course</b>		
Year 1	In Year 1, you'll study subjects including biochemistry, classification, evolution, genetics, soils and plant nutrition and microbiology. In addition, you'll develop analytical skills and a knowledge of statistics.	
Year 2	In Year 2, you'll deepen your knowledge of statistics, experimental analysis and molecular biology. You'll study plant genetics, physiology, and plant diseases, and you'll have the option to study aspects of chemistry or plant ecology. The optional plant ecology module contains a 5-day field trip.	The field trip could be undertaken online depending on the COVID-19 situation in 2022.
Year 3	In your final year, you'll have the opportunity to demonstrate your scientific competence and independence by devising and undertaking a piece of novel research which you present as a professional fully referenced scientific paper and in the form of an oral presentation of a poster.  You'll also develop skills in bioinformatics and you'll further your understanding of plant physiology and plant interactions with microbes. Through the optional modules you'll be able to develop a deeper understanding of bioinformatics or plant genetics.	
<b>Module information</b> 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.		
<b>Core year 1</b>		
	Biochemistry Core module - (20 Credits)  You'll explore the basic concepts and chemical foundations of biochemistry and cell biology to help you develop an	The practical sessions associated with this module are part of an intensive practical week.  The practical week will be supported by supplementary online demonstrations

	<p>understanding of structure and function at the molecular level. This module prepares you for further study in more advanced cell and molecular modules.</p>	<p>of key laboratory techniques. In the event of further COVID 19 interruptions, further face to face contingency arrangements are planned to support student learning</p>
	<p><b>Diversity of Life</b> Core module - (20 Credits)</p> <p>Life on earth is amazingly diverse, colourful and multifaceted. This module introduces you to this variety, tracing the tree of life from its roots to its branches. Beginning with simple, single-celled organisms like bacteria and protists, you'll discover the various forms of complex life that have evolved and how to classify them in a taxonomic system using characteristic features of each group. The module features a large number of practical sessions in which you'll engage with plants, animals and other organisms.</p>	<p>The practical sessions associated with this module are part of an intensive practical week.</p> <p>The practical week will be supported by supplementary online demonstrations of key laboratory techniques. In the event of further COVID 19 interruptions, further face to face contingency arrangements are planned to support student learning</p>
	<p><b>Genetics and Evolution</b> Core module - (20 Credits)</p> <p>You will learn about key concepts in genetics and evolutionary biology, providing you with a broad knowledge of Mendelian genetics and the mechanism of evolution. You will undertake a number of practicals in cell biology and DNA methods and will utilise bioinformatics to access, evaluate and interpret genetic and phylogenetic data.</p>	<p>The practical sessions associated with this module are part of an intensive practical week.</p> <p>The practical week will be supported by supplementary online demonstrations of key laboratory techniques. In the event of further COVID 19 interruptions, further face to face contingency arrangements are planned to support student learning</p>
	<p><b>Microbiology</b> Core module - (20 Credits)</p> <p>This module will introduce you to principal taxonomic groups of microorganisms; you will examine their growth, physiology and culture, and their importance to humans and the biosphere. The module equips you with the necessary skills to carry out safe, aseptic practices with such organisms in a laboratory environment.</p>	<p>The practical sessions associated with this module are part of an intensive practical week.</p> <p>The practical week will be supported by supplementary online demonstrations of key laboratory techniques. In the event of further COVID 19 interruptions, further face to face contingency arrangements are planned to support student learning</p>
	<p><b>Science Skills and Introduction to Statistics</b> Core module - (20 Credits)</p>	

	<p>You will develop the necessary background in science communication, skills and methods essential for a degree in life sciences. You will learn how to analyse quantitative biological data, including statistics and experiment design and how to understand scientific publications and write scientific papers.</p>	
	<p>Soil Science and Plant Nutrition Core module - (20 Credits)</p> <p>You'll explore the basic concepts of soil science, focusing on the physical properties of soil, the fundamentals of soil chemistry and hydrology, and the way in which soils and plants are inextricably interlinked. This module prepares you for further study in more advanced aspects of soil science, plant physiology and land management.</p>	<p>The practical sessions associated with this module are part of an intensive practical week.</p> <p>The practical week will be supported by supplementary online demonstrations of key laboratory techniques. In the event of further COVID 19 interruptions, further face to face contingency arrangements are planned to support student learning</p>
Optional year 1		
	N/A	
Core year 2		
	<p>Data Handling Core module - (20 Credits)</p> <p>In this module, you'll develop the techniques necessary to handle quantitative biological data analysis and you'll start to explore bioinformatics. You will be introduced to the powerful statistical programming language, R, which is critical to current approaches to handling/analysing data, particularly "big data".</p>	
	<p>Genetics of Plant Breeding 1 Core module - (20 Credits)</p> <p>You'll develop an understanding of basic concepts in plant genetics/breeding and how these fundamental principles could be applied to develop high yielding and more resilient crop plants for the future.</p>	
	<p>Molecular Biology and Biotechnology Core module - (20 Credits)</p> <p>This module offers you a unique practical experience of diverse laboratory skills associated with the isolation, handling and manipulation of DNA and proteins. You will</p>	

	cover the main areas of theoretical molecular biology knowledge and its practical applications in current research.	
	<p>Plant Pests and Pathogen Core module - (20 Credits)</p> <p>You'll learn about common important plant pests and diseases, their effects on plant growth and yield, and how to recognise them in the field. You'll also learn how to analyse and interpret published data through student-led discussions about specific pests and diseases and their control.</p>	
	<p>Plant Physiology and Development Core module - (20 Credits)</p> <p>You'll develop a sound knowledge of the basics of plant physiology and development. You'll also build your skills in analysing and interpreting published data through student-led discussions of the role of plant hormones (plant growth regulators) in controlling physiological processes and developmental switches.</p>	
Optional year 2		
	<p>Natural Product Chemistry Optional module - (20 Credits)</p> <p>In this module, you'll learn about the chemistry of natural products. You'll study the chemistry of natural products and the links between molecular structure and properties, establishing connections with the behaviour of these compounds in biological systems. You'll also learn about purification methods and different analytical methods that can be used in the isolation and identification of these compounds.</p>	
	<p>Plants in the Environment Core module - (20 Credits)</p> <p>In this module, you'll consider how plants differ in space and time, and how plant communities are managed. You'll have the opportunity to study natural and agricultural systems in the field during a</p>	<p>This could be an online field trip depending on the COVID-19 situation in 2021.</p>

	<p>five-day field trip. The strong fieldwork element is designed to enhance your practical skills for use throughout the course and beyond.</p>	
	<p>Work placement Optional module - (20 Credits)</p> <p>This module provides you with the opportunity to develop key skills and experience while working in a commercial environment. You will be enabled to develop critical reflection skills as you review your own competencies as they expand and diversify.</p>	<p>This optional module may be available depending upon the COVID-19 situation in 2021.</p>
Core year 3		
	<p>Advanced Plant Growth and Development Core module - (20 Credits)</p> <p>You'll develop an advanced knowledge of plant physiology and development. You'll also further your ability to analyse, interpret and critically discuss published data through student-led discussions of molecular basis of acclimation responses to abiotic stresses.</p>	
	<p>Bioinformatics 1 Core module - (20 Credits)</p> <p>In this module, you'll develop a systematic understanding of the role of computing in biological research, the fundamentals of molecular biology and the key concepts and techniques in bioinformatics. A major focus will be on computer practicals to reinforce the theory within the interactive lectures.</p>	<p>Computer practical sessions for this module will be online-based. Lectures will be pre-recorded and the theory will be reinforced using interactive online-live workshops.</p>
	<p>Honours Projects Core module - (40 Credits)</p> <p>In this module, you'll undertake a piece of commercially/socially relevant research. You are required to identify an area of research directly relevant to plant science and design and undertake appropriate experiments. You'll gain experience of undertaking independent research and analysis, as well as gaining experience in presenting findings in two styles: a written scientific paper and a presented poster to a non-specialist audience.</p>	



	<p>Molecular Plant Microbe Interactions Core module - (20 Credits)</p> <p>You'll develop skills in critical analysis, interpretation and presentation of experimental data. You'll also develop a detailed knowledge of the molecular and genetic processes that underpin the interaction of plants with a range of different microbes.</p>	
Optional year 3		
	<p>Bioinformatics 2 Optional module - (20 Credits)</p> <p>This module provides a more in depth investigation of the techniques and analyses introduced in Bioinformatics 1, focusing on building the programming and computational skills to allow you to design and undertake complex analyses. You will build an understanding and ability to use various industry standard tools. A major focus will be computer practicals to reinforce the theory learnt.</p>	<p>Computer practical sessions for this module will be online-based. Lectures will be pre-recorded and the theory will be reinforced using interactive online-live workshops.</p>
	<p>Current Science Issues Optional module - (20 Credits)</p> <p>This module aims to develop your wider understanding of how science influences and affects society. You'll develop your independent research and analysis skills as you comment on important science issues.</p>	
	<p>Genetics of Plant Breeding 2 Optional module - (20 Credits)</p> <p>You'll develop a deeper understanding of concepts in plant genetics/breeding gained from Genetics of Plant Breeding 1 module. In this module, you will learn how linkage maps are used to map QTLs and clone genes of desirable traits. You will develop a good understanding of different methods for breeding cross-pollinated crops. A special emphasis will be placed on hybrids and hybrid seed production. You will explore genetic and epigenetic mechanisms of heterosis and you'll engage in discussions about why molecular basis of heterosis are still elusive. You will also learn about RNAi technology, phenomics and abiotic stress breeding. Most lectures will consist of a</p>	

	selected topic and a recent paper to develop a deeper understanding and learn about latest developments in the field.	
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How you'll learn		
Teaching	<p>You will be taught through a combination of lectures, laboratory practicals, field trips, visits to employers, seminars, guest speaker lectures and practical workshops. You'll also benefit from tutorial sessions where you can discuss your work and progress with an individual personal tutor, and small group seminars focusing on specific topics.</p> <p>The course is designed to support you in becoming a confident, independent learner and some of your learning will be through experimentation and observation.</p> <p>All teaching material is posted on the virtual learning environment.</p> <p>Your actual contact hours depend on the option modules you select.</p> <p>All courses are informed by the University's Learning and Teaching Strategy 2015-2022</p>	<p>The practical component will be condensed into an intensive practical week rather than being spread across the semester and so minimise your time on campus due to the COVID-19 situation. We will use a "blended learning" approach in your studies that consists of a mix of timetabled face-to-face sessions and intensive practical weeks on campus, together with timetabled live workshops online. This will involve "flipped learning" approach, which means that it is essential that you read material, watch video content or undertake tasks in preparation for a session.</p> <p>The practical week will be supported by supplementary online demonstrations of key laboratory techniques. In the event of further COVID 19 interruptions, further face to face contingency arrangements are planned to support student learning</p>
Year 1	<p>In the first year, two thirds of each module are delivered as practical experimentation either in laboratories, IT labs or in the field. These sessions are supplemented by lectures, and seminars/workshops where you feedback from your structured independent study.</p>	
Year 2	<p>In the second year, you'll continue laboratory and field based experimentation and you'll start analysing published research.</p>	
Year 3	<p>In the final year the teaching will move into student-led workshops where you'll discuss published research papers</p>	
Independent study	<p>When not attending lectures, seminars, workshops 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 director will direct</p>	

	<p>you towards specific readings and/or activities to complete before class through the virtual learning environment.</p> <p>For the 40 credit individual study in your final year, you will undertake independent research working under the supervision of a member of the teaching team who you will meet with regularly.</p>	
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Overall workload	<p>Each 20 credit module requires 200 hours of study which includes formal contact (lectures, practicals, tutorials, workshops), structured independent learning (prescribed reading and/or online exercises) and independent learning.</p> <p>Each module in the foundation year and Year 1 has 60 hours of formal contact, supplemented with 40 hours of structured independent learning. As you develop and become more independent, formal contact and structured learning reduces to 50 hours of contact and 30 hours of structured independent learning per module in Year 2 and 40 hours of contact and 20 hours of structured independent learning per module in Year 3.</p>	<p>Each 20 credit module requires 200 hours of study but the proportion and delivery methods will be more varied. At Level 0 and at Level 4, each module will have 48 hours of face-to-face contact supplemented by structured independent learning. You will also receive an intensive week (30 hours) of practical laboratory sessions in each semester to give you the essential laboratory skills relevant to your modules.</p> <p>At Level 5, your sessions will be delivered as a blended learning mix of on-campus face-to-face sessions and online live class workshops. You will have 9 hours of face-to-face sessions on campus dedicated to your programme with 9 hours of live online class workshops. We will employ a “flipped learning” approach where we will expect you to prepare for the online class workshops by undertaking the directed study beforehand. You will also receive an intensive week (30 hours) of practical laboratory sessions each semester to give you the essential laboratory skills relevant to your modules.</p> <p>At level 6 substantial elements of programme delivery will be interactive online delivery using the “flipped learning” approach. Each programme has a 3-hour programme specific session with each module consisting of 12 hours of online live workshops. In addition, your Honours Project module will have 96 hours timetabled in each semester to enable you to carry out your research.</p>
Academic input	<p>The teaching team consists of highly qualified academics with a range of expertise and experience. They are research-active and have experience in delivering research-informed teaching.</p> <p>All our core team members hold doctoral</p>	

	<p>qualifications and most hold or are working toward postgraduate teaching qualifications. You can find out more about the current teaching on our Meet the Team web page.</p> <p>Postgraduate students sometimes assist in teaching and assessing some modules, however, experienced academics teach the vast majority of lectures and seminars.</p> <p>You should note that members of the teaching team might change.</p>	
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## How you'll be assessed

	<p>Assessment is by both coursework and examination. The course provides you with opportunities to test your understanding of the subject informally before you complete the formal assessments that count towards your final mark. Each year you will be set formative assignments to go through with your tutor. There will also be 'formative' assessment within some of the modules. Practice assessments are developmental and any grades you receive for them do not count towards your module mark.</p> <p>There are also formal or 'summative' assessment. Assessment methods include written examinations and a range of coursework assessments such as essays, reports, portfolios, performance, presentations and your final year individual study project. The grades from formal assessments count towards your module mark.</p> <p>Coursework assessments permit you to develop key scientific and transferable skills and assignments include: scientific lab/log books, written reports, written scientific papers, discursive essays, PowerPoint presentations and poster presentations. There is a maximum of two assessments per 20 credit module studied.</p> <p><b>Feedback</b> You will receive feedback on all practice assessments and on formal assessments undertaken by coursework. Feedback on examination performance is available upon request from the module leader. Feedback is intended to help you learn and you are encouraged to discuss it with your module tutor. We aim to provide you with feedback within 15 working days of hand-in.</p>	<p>Examinations may take the form of take-home online examinations.</p>
Year 1	60% coursework 40% written exams	
Year 2	50% coursework 50% written exams	
Year 3	65% coursework 35% written exams	
Fees		

UK/EU	Full-time £9,250	
	Full-time - placement year £1,850	
	Part-time £4,625	
Overseas	Full-time £13,000	
	Full-time - placement year N/A	
	Part-time N/A	
<b>Course specific costs</b>		
Learning materials	Textbook "Biology: How Life Works, by Morris et al", ISBN-13: 978-1464138263. Currently £39.99. Includes one year's access to Launchpad, an interactive web e-book which is integrated into some of the modules.	We recommend that you use the textbook "Life, The Science of Biology", by Hillis <i>et al</i> ", 12 <sup>th</sup> ed. ISBN-13: 978-1-319-31578-8.
Professional accreditation	N/A	
Industry links	<p>The University's Industry Liaison Lab works with many companies in healthcare research and development, drug discovery and equipment design and manufacture.</p> <p><i>"Venomtech have been very impressed with our partners at Canterbury Christ Church University, this partnership has enabled us to progress projects much faster than we could on our own. This includes being able to generate novel data on the use of our products through student projects, advancing research into new antibiotics and cancer therapies from venoms and increasing the understanding of invertebrate welfare. Generation of this proof of concept data has, and continues to have, a positive influence with our potential customers and therefore our business. I also impart my 10+ years industrial drug discovery experience directly to the students as part of the Drug Discovery and Development module.</i></p> <p><i>As a science employer in the area, Venomtech benefit greatly from being directly involved in the curriculum to make sure the new graduates have the skills useful to employers. This includes an understanding of applied drug discovery that will make CCCU graduates stand out from others in job interviews."</i></p> <p><b>Steve Trim, CEO, Venomtech Ltd</b></p>	



Other important information		
Specialist Facilities	This course is associated with the university's Industry Liaison Labs at Discovery Park, Sandwich. You will have the opportunity to undertake laboratory work at this site. The location of these specialist facilities within an industrial setting facilitates access to and collaboration with biotechnology and pharmaceutical companies.	
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