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	Chemical Engineering (BEng)	
Award level	BEng – Single honours	
How do you want to study?		
Start Date	Sept 2020	
Modes of study	Full-time	
Duration	3 years full-time	
UCAS code	H103	
Location	Canterbury	
Partner institution	N/A	
Available with a Foundation Year	Yes	
Overview		
	Chemical engineers convert materials into products used the world over, every day. These range from pharmaceuticals, clothing, petrol, paints, food, drinks and more – all of which are engineered with financial and environmental considerations in mind. On this course you will use the CDIO (conceive, design, implement, operate) approach developed by the Massachusetts Institute of Technology. CDIO gives you sought-after, hands-on experience that you can deploy in your future career which could include energy management, water and food security, resource scarcity, climate change and more.	Chemical engineers convert materials into products used the world over, every day. These range from pharmaceuticals, clothing, petrol, paints, food, drinks and more – all of which are engineered with financial and environmental considerations in mind. This course is focused to support chemical engineering for pharmaceuticals/cosmetics/food industry. Chemical Engineers now and future are important to ensure mass manufacturing of chemicals for COVID19 testing, vaccine production of flu and future COVID19 vaccine for the world population.
Why study Chemical Engineering?		
	The role of chemical engineers has never been so important. As well as designing and delivering products ranging from pharmaceuticals, cosmetics, food and drink, they have a responsibility to help manage the world's resources and protect the environment.	The role of chemical engineers has never been so important. As well as designing and delivering products ranging from pharmaceuticals, cosmetics, food and drink, they have a responsibility to help manage the world's resources and protect the

	Designed with input from industry experts, this course follows a practical problem-solving approach. You'll be able to unlock your creative potential and build technical expertise, so you become a highly skilled, work-ready chemical engineering graduate who can develop innovative ways to turn raw materials into everyday products. You'll be fully immersed in academic and practical engineering, gaining vital hands-on experience and developing advanced skills in professional standard labs while learning from industry experts. You'll use the pioneering CDIO (Conceive, Design, Implement, Operate) approach to problem solve pharmaceutical, chemical and process safety issues. The CDIO approach is an international engineering education model, developed by the Massachusetts Institute of Technology (MIT). It allows you to learn in a practical, hands-on way to find creative, evaluated solutions to industry related engineering challenges and we are one of only a handful of universities in the UK to offer CDIO.	environment. **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 a blend of on and off campus practical learning in engineering and science laboratories and off-campus on-line theoretical and practical learning. The off-campus hands on practical learning are being designed to use resources provided or common household items 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 aided design using Fusion 360** Read Less **The on and off campus practical elements of the course will prepare you to enter an engineering career with varied and exciting prospects. A proportion of group-work activities will be on-line developing your skills for working world COVID19 endemic. You'll work on individual and group projects supported with on-line tools akin to current professional engineering working activities and Personal Academic Tutor. You will be supported by academic teaching team on and off campus and on-line at timetabled sessions.**

		You'll be fully immersed in academic and practical engineering. The practical elements of the course we will help you develop on and off campus will prepare you to enter an engineering career with varied and exciting prospects. You'll work on individual and group projects supported with on-line tools akin to current professional engineering working activities and Personal Academic Tutor. On-campus learning provide vital learning, experience and develop your advanced skills in professional standard labs while learning from industry experts through on-line guest lectures. You'll use the pioneering CDIO (Conceive, Design, Implement, Operate) approach to problem solve pharmaceutical, chemical and process safety issues. The CDIO approach is an international engineering education model, developed by the Massachusetts Institute of Technology (MIT). It allows you to learn in a practical, hands-on way to find creative, evaluated solutions to industry related engineering challenges and we are one of only a handful of universities in the UK to offer CDIO.

Entry requirements	88-112 UCAS points (including A level or equivalent in maths, physics, applied science or engineering) Further entry requirements o 5 GCSEs grade C/4 or above (including maths, English, science) o Science can be physics, chemistry, biology or computer science BEng Chemical Engineering with Foundation Year and MEng Chemical Engineering are also available. More information about entry requirements.	
About the course		
Years 1-3	During the course, you'll gain a fundamental understanding of core aspects of chemical engineering such as chemical process engineering design, maths and computing for chemical engineers, heat transfer and fluid flow, physical chemistry and thermodynamics. As you progress through the degree, you will complete projects and develop specialist knowledge and skills in areas such as process design and control, transport phenomena, separation processes and chemical reaction engineering. In the final year, you'll work independently and as part of a team on a major design project in chemical engineering. The strong focus we place on preparing you for employment means you'll have an opportunity to undertake a work placement within an engineering organisation. Here you can make your mark on a live project and develop your transferable skills to help your CV stand out from the crowd.	
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 Chemical Engineering	

	Core module - (40 Credits) This module introduces you to chemical process engineering and design. You will also have an overview of major equipment used in chemical processing plants and typical plant configurations applying, where appropriate, chemical engineering fundamentals such as solving material and energy balances. You will develop knowledge and understanding of chemical engineering; professional practice, safe operational working practices and key commercial tools employed by industry to support chemical engineering practice and principles.	
	Mathematics and Computing for Chemical Engineers Core module - (20 Credits) You will acquire background mathematical abilities necessary to fully engage with subsequent degree-level chemical engineering studies. After a brief review of core mathematical skills, you'll study single and multiple variable calculus and statistics. You will also be introduced to a variety of software packages that can support the application of the mathematical techniques relevant to their subject area.	Mathematics and Computing for Engineers Core module - (20 Credits) In the first year, level of study, Mathematics and Computing for Chemical Engineers has been updated to the Mathematics and Computing for Engineers. The module content is unchanged the module will focus on developing your confidence in applying mathematics and statistics principles, and computing skills in context to engineering, ensuring you have the mathematical and digital skills for your engineering ambitions.
	Heat Transfer and Fluid Flow in Processes Core module - (20 Credits) You will be introduced to the principles of material, energy and momentum balancing for non-reacting and reacting steady state systems in chemical engineering. You'll develop skills in properties of fluids, the transfer of material, energy and momentum and relevant thermodynamics. You will formulate and solve relevant problems for simple single and multiple unit process systems to support chemical process design and operation.	
	General Chemistry Core module - (20 Credits)	Introduction to Electro-Mechanical Systems and Practice Core module - (20 Credits)

	You'll develop your capabilities in fundamental chemistry theory and practice. You will also develop knowledge in physical, inorganic and organic chemistry, as well as developing further key laboratory skills.	In the first year, level of study, General Chemistry has been replaced with Introduction to Electro-Mechanical Systems and Practice as we have identified to support your future employment the need to develop your learning more areas of engineering. We feel that this practical problem-based module will help you develop knowledge and skills in engineering practice and your future career working with engineers in other fields of engineering. You will gain the opportunity to learn the fundamentals of laws of physics, electronic, electrical and mechanical principles, methods and practice used in commercial engineering components. You will also develop engineering practical workshop skills to manufacture and fabricate engineering products.
	Introduction to Physical Chemistry and Thermodynamics Core module - (20 Credits) You will study basic chemical kinetics, quantum mechanics and thermodynamics. By the end of the module, you should be able to determine the speed of a chemical reaction and whether a chemical reaction is likely to proceed.	
Optional year 1		
	Placement Module You will have the option to do a placement module at any time in your degree. The placement module is designed to permit different modes of placement, from day-release, vacations, and year-long.	
Core year 2		
	Professional Chemical Engineering and Development Core module - (40 Credits) You will learn about and apply the concepts of chemical, bio-chemical and pharmaceutical process design, design	

	hierarchy, process flowsheeting, plant layout, plant economy, plant optimisation and plant safety. You'll also examine the wider social, environmental, business and financial contexts in which a professional chemical engineer operates, with particular attention to legal, safety and ethical responsibilities.	
	Fundamentals of Process Design and Control Core module - (20 Credits) This module deepens your learning and application of process plant design for control and communicating process control and instrumentation configurations of process plant through P&I diagrams. You'll learn how to apply your knowledge and understanding of process automation to design, operate, and optimally automate control a chemical operation.	
	Transport Phenomena Core module - (20 Credits) This module builds on the module Heat Transfer and Fluid Flow in Processes. It gives you a comprehensive background into the study of exchange of mass, energy and momentum between observed systems, both in steady and unsteady-states.	
	Separation Processes Core module - (20 Credits) You'll learn about the principles, mechanism and design criteria of mixing, dispersing and separation process operations. You will develop your learning through practice with single and simple multi-phase operations.	
	Chemical Reaction Engineering Core module - (20 Credits) You will learn and apply chemical reactions thermodynamics, kinetics and principles of chemical engineering processes. This helps scale up manufacture of exothermic and endothermic reactions, operating safely, efficiently and in a sustainable manner.	
Optional year 2		
	Placement Module You will have the option to do a placement module at any time in your degree. The	

	placement module is designed to permit different modes of placement, from day-release, vacations, and year-long.	
Core year 3		
	Design Project in Chemical Engineering Core module - (40 Credits) In this module, you'll work individually and as part of a team to develop a complex chemical engineering system. You'll also learn about the design and commissioning process/tools involved in developing a complex piece of equipment.	
	Advanced Chemical Reaction Engineering Core module - (20 Credits) You'll study and apply advanced concepts in chemical reaction engineering, notably non-ideal reactors and transport effects in complex reaction systems.	
	Advanced Transport Phenomena and Process Control Core module - (20 Credits) This module deepens your understanding of the principles of complex single phase flow and introduces you to the principles and applications of multiphase flows. You will also enhance your skills in processing and process control mathematical modelling. This will help you to research and develop control solutions offline of a process plant. The module will also help you to be more effective at critically analysing a process plant design for automated control purposes. You will select appropriate control schemes and strategies for common operational units within the process industry.	
	Molecular and Engineering Aspects of Biotechnology Core module - (20 Credits) You will study biological and bioengineering principles underlying the development, synthesis, production, purification and therapeutic use of recombinant proteins. The module will train you to apply and analyse the associated engineering required to support the mass process production of molecular and bio-systems.	

	Process Safety, Sustainability and Environmental Protection Core module - (20 Credits) This module prepares you to critically evaluate the safe, profitable operation of a chemical facility in accordance with relevant environmental, ethical and safety guidelines and legislation. You will gain risk management skills in hazards perception, identification, quantification and mitigation.	
Optional year 3		
	Placement Module You will have the option to do a placement module at any time in your degree. The placement module is designed to permit different modes of placement, from day-release, vacations, and year-long.	

How you'll learn		
Teaching	You will be taught through a combination of lectures, seminars, tutorials and workshops. Seminars and tutorials in smaller groups will enable you to discuss and develop your understanding of topics covered in lectures. In addition, you will meet with your academic personal tutor and will spend a significant amount of time gaining hands-on experience in the computing and engineering laboratories. All courses 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 engineering and science laboratories and off-campus on-line theoretical and practical learning. The off-campus hands on practical learning are being designed to use resources provided or common household items 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 aided design using Fusion 360** **Each module will have face to face on campus learning and off campus on-line learning.** On-line learning will be provided by virtual learning environment Blackboard and appropriate specialist software tools that support certain module areas, for example process design using APSEN. Each 20-credit module typically involves the following amount of contact time: Foundation Year (Year 0) - 60 hours Year 1 - 60 hours Year 2 - 50 hours Year 3 - 40 hours The modules are led by a team of

		engineering lecturers, senior lecturers and principal lecturers. Laboratory work is also supported by technicians and postgraduate demonstrators. Each year you will complete a team CDIO project (typically sourced from industry) in a 40-credit module. These large group projects provide you with the opportunity to reflect on and apply your knowledge and understanding to a real-world scenario while building your confidence so you can: Work effectively and supportively in diverse and inclusive groups. Communicate effectively in groups and one-to-ones. Apply project management to group-work. Apply principles of commercial management and solutions considerations. Develop effective communication with professionals from other disciplines, especially clinicians. Contribute to industry through your solutions. Provide tangible results for your portfolio of evidence for future employment. You'll also benefit from drop-in academic and peer learning mentoring sessions. All programmes are informed by the University's Learning and Teaching Strategy 2015-2022.

Independent study	When not attending lectures, seminars, tutorials, workshops or other timetabled sessions you will continue learning through self-study. Typically, this involves reading books and articles from academic journals, undertaking research in the library, and preparing for coursework assignments/examinations and seminars. Your module tutor will direct you towards specific readings and/or activities to complete before class.	When not attending lectures, seminars, tutorials, workshops or other timetabled sessions you will continue learning through self-study. Typically, this involves reading books and articles from academic journals, undertaking research in the library, and preparing for coursework assignments/examinations and seminars. Your module tutor will direct you towards specific readings and/or activities to complete before class. Additional drop-in academic and peer learning mentoring online sessions with your personal academic tutor will be typically provided and you will be encouraged to make use of and support these sessions, to develop your learning. They are also an opportunity to apply your learning on new unfamiliar problems with the academics. As at other institutions these sessions have supported students to progress in their studies and provided valuable evidence for employment.
Overall workload	You will study a range of modules which (per module) will typically consist of 25 hours of lectures and 25 hours in laboratories/tutorials/workshops per week, depending on the individual module. In some cases, the balance may change, for example, the Process Design 40 credit module could consist of 12 hours of lectures, 24 hours of tutorials and 48 hours in computing and chemical engineering laboratories. In addition to structured teaching times, you'll also undertake self-study. The typical amount of time for all activities associated with one 20 credit module is 200 hours which is made up of class contact time in lectures, tutorials and workshops, laboratory sessions, module preparation,	Each 20 credits of a course of study, requires 200 hours of input over the academic year. This includes class timetabled contact time on and off campus and on-line; lectures, tutorials, workshops and laboratories. Also includes yourself study time; module preparation, module learning contextualisation, assessment research, development and submission of assessments, and examination revision.

	module learning contextualisation, assessment research, development and submission, and examination revision.	
Academic input	The teaching team includes senior lecturers, principal lecturers and readers with laboratory learning supported by senior and junior technicians and postgraduate demonstrators. The academics are typically specialists and researchers in a particular field, for example, bioprocessing, process control or thermodynamics.	
How you'll be assessed		
Years 1-3	You will undertake coursework assessments and examinations. The coursework aims to be balanced in type, variety and appropriateness across each academic year and assessment could involve case study analysis, group project-based learning, laboratory investigation and write up, online tests, tutorial problems and questions, individual and group presentations, completion of a laboratory book, viva voca, CDIO projects, and work-related/based activity. For written assessments, the word count or equivalent is provided. At level 6 (typically the third year of a full-time undergraduate degree) you will be required to complete a substantial group CDIO project which will contain an individual research and development project and you will be required to write and submit a dissertation. You will be provided with a module leader, module team and academic supervisor support and guidance throughout this project.	**In addition to previous information Examinations maybe open-book, closed book style exam, on-line, or 24hr take home exam.**
Fees		
UK/EU	Full-time £9,250	
	Part-time N/A	
Overseas	Full-time £13,000	
	Part-time N/A	
UK/EU with placement Year	Full-time £1,850	
	Part-time N/A	
Overseas with placement Year	Full-time N/A	
	Part-time N/A	

Course specific costs		
Travel	Additional costs include travel to and from Canterbury to Kent Science Park, Sittingbourne or Discovery Park, Maidstone or CCCU Medway campus as when required for learning. Also possible opportunities to visit Industrial facilities on the Isle of Sheppey, Medway, Maidstone, Ashford and Discovery Park, Maidstone and partner institutions in Europe.	**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.** Additional costs include travel to and from Canterbury to Kent Science Park, Sittingbourne or Discovery Park, Maidstone or CCCU Medway campus as when required for learning. Also possible opportunities to visit Industrial facilities online on the Isle of Sheppey, Medway, Maidstone, Ashford and Discovery Park, Maidstone and partner institutions in Europe.
Professional accreditation	N/A	
Industry links	N/A	
Other important information		
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