



BSc single honours

Animal Science with foundation year

Year of entry 2018/19 ▼

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Animal-based enterprises operate in a tightly regulated environment and require well trained, knowledgeable professionals with knowledge of animal welfare, health and behaviour.

You will develop a detailed knowledge of animal genetics, molecular biology, and biochemical and physiological processes, and have the opportunity to interact and work with a range of employers in the field. You will be able to take advantage of industrial collaborations with specialist research-based companies, including animal breeding and research companies, through the Life Sciences Industry Liaison Lab at Discovery Park.

You will explore areas including:

- anatomy and physiology

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- genetics of animal breeding
- animal pests and diseases.

WHY ANIMAL SCIENCE?

Recent changes in animal welfare laws in Britain have meant that there is now more control and regulation of all animal based enterprises. This has resulted in a greater need for a scientific approach to animal management and welfare across all businesses that work with animals. These sectors require well prepared animal scientists able to apply their knowledge to emerging management issues.

Did you know?

As part of your degree programme, you will have the opportunity to take part in a five-day field trip studying animal behaviour.

This programme seeks to provide you with a stimulating and challenging experience, and is intended for those aspiring to work in animal care, welfare or animalbased industries, from zoos and wildlife parks, to pet shops, veterinary situations, farms and wildlife conservation. Special consideration is given to scientific understanding of animal physiology and welfare.

This programme also provides a vehicle for the development of a set of transferable skills appropriate to a wide range of animal care, welfare and management settings, and for further advanced study.

WHO IS THIS COURSE FOR?

This course is for you if you are passionate about animal welfare and conservation. It will provide an inspiring and demanding experience and is ideal for students who aspire to work in animal care, welfare, veterinary or other animal based industry. The degree is also suitable for those wishing to work in microbiology, in agriculture and in the laboratory. You will gain a broad background knowledge and essential practical skills.

WHAT WILL I STUDY?

Entrants to foundation level study the core sciences of biology, chemistry and physics as well as study skills and introductory level maths. Completion of level 0 permits students to progress to level 4.

From this broad foundation, at level 4 a set of compulsory modules cover introductory biology, diversity of life, genetics and evolution, animals in the environment and biochemistry and scientific skills. The degree encompasses the study of animals in natural and man-made environments. There is also an emphasis on experimental science, so you learn a wide range of practical techniques, including microbiology and molecular biology.

You can study **French, German, Italian, Mandarin Chinese** and **Spanish** as part of, or alongside, your course.

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At level 5 and 6, modules probe deeper into animal physiology, animal disease, developmental biology and animal behaviour. There is also an opportunity to undertake a placement module. In year four, modules examine the scientific background to animal health and welfare, and animal pathology. You also carry out a practical research project as part of a final year honours project which could be carried out in the field, at a zoo or wildlife park or in the laboratory.

[MORE INFO](#)

MODULE INFORMATION

In line with good practice, module content is regularly updated and module titles may on occasion change to reflect updated content in the advances in the field of study.

Year 0 - Foundation Year

Biological concepts

This module aims to introduce students to the central principles of biology, namely the basic structure, function and variety of living organisms and how they reproduce. It also aims to give students the basic transferable skills needed to understand scientific reasoning and to undertake scientific investigations.

Advancing biology

The aim of this module is to build on material learned in the module 'Biological concepts'. Elements of genetics and molecular biology are extended and you will be introduced to various facets of the environmental sciences, including ecology and conservation, agricultural science, and pollution science. The module also aims to extend your practical skills within the life sciences.

Principles of chemistry

This is an introductory module that aims to develop your familiarity with fundamental chemical concepts such as atomic structure, chemical nomenclature, bonding, stoichiometry and a range of chemical reactions. The module also aims to develop your basic chemistry laboratory skills.

Advancing chemistry

This module aims to build on the knowledge acquired in Principles of Chemistry and to explore different fields within the subject of chemistry (physical chemistry, organic chemistry, biochemistry and environmental chemistry). The module will also further develop your laboratory skills.

Physical laws of the natural world

The aim of this module is to introduce you to the physical concepts that underpin all of science and how physics are studied in the natural sciences. You will develop an understanding of how physical laws are used to describe natural phenomena and how they may be applied to gain a deeper knowledge of particular systems and processes.

Study skills

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The course aims to give you the basic transferable skills needed to understand and practice scientific reasoning, to undertake scientific investigations and to communicate effectively scientific ideas and outcomes.

In line with good practice, module content is regularly updated and module titles may on occasion change to reflect updated content in the advances in the field of study.

Year 1

Animals in the Environment

This module explores the interaction of humans with, the environment and animals. It aims to develop your understanding and appreciation of vertebrate and invertebrate animals and the role they play in selected habitats. It also introduces you to aspects of animal behaviour. The module involves a series of practical sessions and field trips to a series of animal-based enterprises.

Biochemistry

You will be introduced to the basic concepts and chemical foundations of biochemistry and cell biology to develop an understanding of structure and function of animals at the molecular level. You will be introduced to the basics of immunology and endocrinology and undertake a number of practicals based on the theory you have learnt.

Diversity of Life

Life on earth is amazingly diverse, colourful and multifaceted. The diversity of life module introduces you to this variety, tracing the tree of life from its roots to its branches. Beginning with simple, singlecelled organisms like bacteria and protists, you 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 engage with plants, animals and other organisms.

Genetics and Evolution

You will learn about key concepts in genetics and evolutionary biology, providing a broad knowledge of Mendelian genetics and the mechanism of evolution. You will undertake a number of practical in cell biology and DNA methods and utilise bioinformatics to access, evaluate and interpret genetic and phylogenetic data.

Microbiology

This module will introduce you to principal taxonomic groups of microorganisms; examines 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.

Science Skills and Introduction to Statistics

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.

Year 2

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Animal Anatomy and Physiology

By examining mammalian anatomy and physiology and comparing these systems with those of a range of other animal groups you will develop an integrated understanding of animal form and function. Throughout this module, communication, evolutionary history and homeostatic processes are used as unifying themes. Dysregulation of these systems will also be investigated. A number of practical sessions will be undertaken based on the theory you have learnt in the lectures.

Animal Pests and Diseases

This module aims to teach you about pests, parasites and pathogens which affect animals, and how they affect the wider world. The course begins with introduction to the taxonomy and biology of these organisms, the economic impacts they have on societies around the world, and the ways in which animals have evolved to fight infection and infestation. You will then discuss and comment on the mechanisms by which humans have attempted to control pests, parasites and pathogens such as the use of antibiotics, pesticides, vaccination and biological control.

Data Handling

This module aims to develop the techniques necessary to handle quantitative biological data analysis and introduce the beginnings of bioinformatics. You will be introduced to the powerful statistical programming language, R. This programming language is critical to current approaches to handling/ analysing data, particularly "big data".

Genetics of Animal Breeding

This module will provide you with an understanding of strategies employed for the genetic improvement of both livestock species and other domesticated animals, taking into consideration the associated ethical implications. You will develop a further understanding of key genetic principles and there will be a particular emphasis on the various applications of modern genetic techniques such as genome wide association studies, cloning and transgenics.

Molecular Biology and Biotechnology

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 cover the main areas of theoretical molecular biology knowledge and its practical applications in current research.

Optional modules

Options are subject to availability and may change. The work placement module is offered based on suitable work placement being available and the student being accepted by the employer offering the placement.

Animal Behavioural Ecology

This module aims to introduce you to the ecological side of animal behaviour. You will learn about the main influences on behaviour and how these can influence animal behaviour at an individual, group and species level. After undertaking this module, you will be able to design and carry out animal behavioural studies in an ecological context.

Natural Product Chemistry

The aim of the module is to provide students with an understanding of the chemistry of natural products, building on the chemical knowledge acquired in level 4 modules. It aims to introduce students to the chemistry of natural products and the links between molecular structure and properties, establishing connections with the **Behavioural Ecology** and **Natural Product Chemistry** modules.

these compounds in biological systems. It also introduces purification methods and different analytical methods that can be used in the isolation and identification of these compounds, and to encourage a critical approach to these methods.

Work Placement

This module gives you the opportunity to undertake a summer placement in a commercial environment to develop key skills and work experience. By the end of this module, you will be able to critically reflect and review your own competencies and development requirements.

Year 3

Animal Health and Husbandry

The aims of the module are to explore the importance of animals in society and the scientific background to animal welfare issues. This includes the study and analysis of nutrition, good husbandry, disease control, pain perception, the ability of animals to cope with their environments and the physiological and behavioural aspects of welfare.

Animal Reproduction and Development

This module examines the genetic and endocrine control of reproductive behaviour and other aspects of reproduction, of embryological growth and subsequent ontogeny of selected vertebrates and invertebrates. This allows you to develop an understanding of how the processes underpinning animal reproduction and development function and have evolved.

Bioinformatics 1

This module aims to develop a systematic understanding of the role of computing in biological research, the fundamentals of molecular biology and to introduce the key concepts and techniques in bioinformatics. A major focus will be computer practicals to re-enforce the theory within the interactive lectures.

Honours project

This module provides you with autonomy in your learning as you pursue in depth the study of a topic of your own choice within animal science. In doing so, you will gain practice at organising your thinking in a scientific context and will increase your confidence in dealing with scientific problems and issues. With a broad scope, this module allows you to work with external businesses and partners and to potentially produce work that can be either published as a peer reviewed article or that may be of real world value to a partner organisation.

Optional modules

Options are subject to availability and may change

Cancer Biology and Immunology

In this module, you will obtain a comprehensive understanding of the biology and genetics of cancer and the role of the immune system in tumour development in humans and other animals. It will introduce a range of medical techniques used to diagnosis cancer and you will study the latest cutting-edge treatments and the molecular mechanism used by those treatments. You will participate in discussions on the impact cancer has on people's lives and how patients are cared for including end of life care.

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Bioinformatics 2

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 re-enforce the theory learnt.

Current Science Issues

In this module, you will develop a wider understanding of how science influences and affects society. You will develop your independent research and analysis skills as you comment on important science issues. The weekly section research / visiting speaker lecture will be used as a base to discuss topics.

WHAT CAN I DO NEXT?

This course provides opportunities for careers in key positions in a range of animal-based fields, including zoos, the pet trade, stables or kennels, veterinary practice management, wildlife conservation management and the pharmaceutical industry. Some graduates have become teachers and others have gone on to postgraduate study.

Transferable skills developed by this course are valuable in other nonscientific areas of industry, commerce and the media. These include time management, statistical and planning skills, communication and presentation skills, and an ability to think critically.

FEES AND ADDITIONAL COSTS

Fees

The 2018/19 annual tuition fees for this course are:

	UK / EU	Overseas
Full-time - Foundation Year 0	£6,165	N/A
Full-time - years 1-3 *	£9,250	£11,500

Tuition fees for all courses are payable on an annual basis, except where stated.

* The tuition fee of £9,250 relates to 2018/19 only. Please read the 2018/19 Tuition Fee Statement for further information regarding 2018/19 tuition fees and mid-course year on year fee increases.

- Read advice about funding your degree
- See information about the financial support available for undergraduate studies
- If you would like information about paying your fees, please contact finance@canterbury.ac.uk [Privacy settings](#)

- For specific fee queries, please contact fees@canterbury.ac.uk

Additional course costs

Although we aim to minimise any additional costs to students over and above the course tuition fee, there will be some additional costs which students are expected to meet.

Costs applicable to all students

Category	Description
Text books	Own purchase text books
Travel to other sites	Where travel to other sites is required, this will be payable by the student
Library Fees and Fines	Where students fail to return loaned items within the required time they will be responsible for the cost of any Library Fees and Fines applicable
Printing & Photocopying	The cost of printing and photocopying undertaken by students to support their individual learning are payable by the student
Graduation ceremonies	It is free for the student to attend the ceremony itself. Guest tickets and robe hire / photography are additional costs payable by the student

General principle policy

The University's general principles policy for additional course fees are set out here

Category	Included in the tuition fee	Additional cost to student
Field trips (including trips abroad and trips to museums, theatres, workshops etc)	No, if the trip contributes to the course as an optional module.	Yes if the trip is optional.
Travel and accommodation costs for placements	No	Travel and accommodation costs for professional placements within the Education and Health & Wellbeing Faculties. Travel and accommodation costs for other work placements.
Text books	No	Own purchase text books.
DBS / Health checks	No	Yes
Professional Body registration	No	Yes Privacy settings

Category	Included in the tuition fee	Additional cost to student
Travel to other sites (e.g. travel to swimming pool for lessons)	No	Yes
Clothing / Kit	Yes, where the clothing / kit is essential for Health & Safety reasons.	Yes, where the clothing is kept by the student and not essential for health and safety reasons.
Learning materials	Essential learning materials (excluding text books) in connection with the course.	Additional materials beyond the standard provision essential for the course or where the costs are determined by the student's area of interest and the outputs are retained by the student.
Library fees and fines	No	Yes
Printing and photocopying	No	Yes
Social events	No, unless the event forms an essential part of the course.	Yes, unless the event forms an essential part of the course.
Graduation ceremonies	It is free for the student to attend the ceremony itself.	Guest tickets and robe hire/ photography are additional costs payable by the student.

LEARNING AND TEACHING

In the Section of Life Sciences, we practice 'research-involved teaching'. This means that all of the modules you will study are led by experienced academic staff who are specialists and active researchers in relevant areas, including animal scientists, biochemists, ecologists, chemists and physicists. The programme is designed to give you opportunities to develop skills and experience by engaging with research either as part of taught modules or via extra-curricular internships and volunteering.

The emphasis is on developing independent learners and learning by student experimentation and observation. At foundation level (level 0) and level 4 two thirds of each module is delivered as practical experimentation either in laboratories, IT labs or in the field. These sessions are supplemented by lectures, and seminars/workshops in which you feedback from your structured independent study. By level 5 laboratory and field based experimentation is complemented by analysis of published research and by level 6 the emphasis is on learning being driven by student led workshops discussing published research papers. All teaching material is posted on the internal VLE Blackboard. Learning is supplemented at all levels by tutorial sessions with an individual personal tutor and small group seminars (12 sessions) which are requested by students to address specific topics.

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Each 20 credit module requires 200 hours of study which comprises of formal contact (lectures, practicals, tutorials, workshops), structured independent learning (prescribed reading and/or online exercises) and independent learning. Each module at foundation level and level 4 has 60 hours of formal contact, supplemented with 40 hours of structured independent learning. As students develop and become more independent formal contact and structured learning reduces to 50 hours of contact and 30 hours of structured independent learning at level 5, and 40 hours of contact and 20 hours of structured independent learning at level 6.

ASSESSMENT

Assessment is by both coursework and examination. Individual modules are assessed either solely by coursework or by an equally-weighted combination of coursework and examination. Examination allows assessment of a student's understanding of important key concepts and accounts for less than half the assessment of the programme. Coursework assessments permit students 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.

SPECIALIST FACILITIES

You will often be able to use modern, research grade equipment during taught modules and for your individual research on your dissertation project.

INDUSTRY LINKS

The Life Sciences Industry Liaison Lab at Discovery Park in Sandwich, Kent was launched in March 2016. Discovery Park is a fabulous site with well over 100 companies now based there, many of which are active in the science sector.

APPLY NOW

UK/EU

Full-time study

APPLY VIA UCAS

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Need some help?

For advice on completing your application please contact the **Admissions Enquiry Team**:

Email: admissions@canterbury.ac.uk

Tel: +44 (0)1227 928000

FACT FILE

UCAS course code

C301 Animal Science with Foundation Year

UCAS institution code

C10

Length

4 years full-time

Starts

September 2018

Entry requirements

For entry onto the 4 year full-time programme (7 year part-time/level 0 full-time only) candidates should hold a GCSE in English language grade C or above.

[More entry requirement details](#)

Location

Canterbury

School

Human and Life Sciences

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Course Enquiries for 2019, Part Time and Postgraduate Taught:

+44 (0)1227 928000

University Switchboard:

+44 (0)1227 927700

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