

Bioveterinary Science

 BSc (Hons)

COURSE DETAILS

- A level requirements: [ABB](#)
- UCAS code: D900
- Study mode: Full-time
- Length: 3 years

KEY DATES

- Apply by: [25 January 2023](#)
- Starts: 25 September 2023

Course overview

This three-year programme will provide you with a wide knowledge of biological and veterinary animal sciences, practical techniques and transferable skills for careers allied to veterinary science, scientific research, conservation, animal welfare and the biotechnology and pharmaceutical industries.

INTRODUCTION

The programme contains bespoke modules in Bioveterinary Science, in topics such as animal husbandry and welfare, veterinary form and function, veterinary diseases, epidemiology, pathology and public health. Students also choose modules available in the School of Life Sciences, which include animal biodiversity, animal behaviour, zoology practical skills, comparative animal physiology and conservation biology.

There are several options available in years two and three allowing the student to tailor their degree to fit with their strengths, interests and career aspirations. In the final year, all students carry out an extended research project of their choice with an active research group. Various modes of

teaching are used throughout the programme including lectures, practical classes, problem-based learning and guided study supported by our Virtual Learning Environment.

At Liverpool, we offer two routes for students wishing to study for a degree in Life Sciences. You can enrol on one of our Deferred Choice Programmes (C130 or C100) that allows students to learn about the different subjects available in Life Sciences before specialising, or retain their broad interests and gain a degree.

Alternatively, students can enrol on a specific programme of study that specialises in one area of the Life Sciences.

WHAT YOU'LL LEARN

- Knowledge and understanding of biological and veterinary animal disciplines
- Animal husbandry and welfare
- Veterinary diseases, form and function and public health
- Animal biodiversity, animal behaviour, comparative animal physiology, zoology

- practical skills and conservation biology
- Methods and transferable skills for professions allied to veterinary science
 - How to communicate scientific concepts and findings in a variety of formats
 - Skills in critical thinking and data interpretation in the context of bioveterinary science
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Course content

Discover what you'll learn, what you'll study, and how you'll be taught and assessed.

YEAR ONE

Year one's modules will develop your knowledge of the subject giving you the ability to apply, evaluate and interpret this knowledge to solve problems in areas like biotechnology, biomedicine, and molecular cell biology. You will be introduced to a spectrum of practical skills and techniques, including some fundamental components

of digital technology that will enable you to perform robust statistical analyses of biological datasets. You will gain expert training in a vast range of areas which will equip you for the more specialised modules coming in the later years of the degree.

COMPULSORY MODULES

MOLECULES AND CELLS (LIFE101)

Credits: 15 / Semester: semester 1

This module describes the detailed composition of cells and the processes by which they obtain and generate energy, grow, replicate and eventually die.

The lectures will be supplemented with on-line resources and illustrated with some of the latest research methods that are used to study cell structure and function.

Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed by both continuous assessments and by a final examination.

EVOLUTION (LIFE103)

Credits: 15 / Semester: semester 1

This module describes the evolutionary processes that have resulted in the generation of the diverse life forms that populate the planet.

This includes the theory of evolution by natural selection, and the genetic processes that result in gene evolution and diversity.

Selected scenarios and case studies will apply evolutionary concepts, showing the fundamental importance of evolution to a broad range of the life sciences.

The module is split into two parts: the first part (A) is the same for all students, the second part (B) contains a number of parallel strands tailored to students interest.

Students will be advised by their programme director which strand to follow.

The lectures will be supplemented with a variety of on-line resources.

Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed by continuous assessments.

GRAND CHALLENGES IN BIOLOGY (LIFE105)

Credits: 7.5 / Semester: semester 1

This module introduces students to how grand challenges (scientific and societal) are addressed in universities and in particular at the University of Liverpool. Students will be introduced to four major topics (Infections and Global Health, Ageing, Food Security, Personalised Medicines) by experts in the respective fields. Emphasis will be placed on students understanding concepts and assembling information rather than memorizing facts. The material will be delivered based on the concept of a scientific conference with plenary talks and parallel sessions presented by the lecturers, and (in light of Covid-19 driven procedures at scientific meetings) a video session driven by student input. Assessment of lecture material and associated readings will be by continuous assessment.

EXPERIMENTAL SKILLS IN CURRENT BIOLOGY (LIFE107)

Credits: 15 / Semester: whole session

This is the first practical module that students will take in the School of Life Sciences. The skills that students acquire will be needed for other practical modules that they will take in semester 2 Year 1, and during Year 2 and will prepare them for their year 3 research project and for their subsequent career.

This module is designed to teach the basic multidisciplinary skills required in the biological sciences.

It aims to develop careful working practices, experimental design and interpretation of results. Skills acquired in this module will be both utilised and enhanced by the co-requisite module LIFE 109 (communication and study skills and quantitative skills).

The way in which LIFE 107 is taught and assessed is designed to place emphasis on encouraging students to take responsibility for their own learning. Demonstrators and academic staff will be on hand to answer questions or show students how to use lab equipment.

Resources will be available online via VITAL and include a weekly Blog, technical manual, module handbook, lab instruction manual and weekly lectures.

The module will be taught in weekly practical classes and it will be assessed through continuous assessment (assessment 1-2) and a final exam (assessment 3).

ANIMAL BIODIVERSITY (LIFE112)

Credits: 15 / Semester: semester 2

This module studies the body plans of the major groups of animals and explores the relationship between body form and function.

It also discusses the evolutionary origins of these basic body plans and how these have been modified to adapt to particular habitats.

The module will be taught through a mixture of asynchronous and synchronous material. The former consists of pre-recorded videos and other online learning material, the latter consists of scheduled interactive online sessions. Students will also be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed through continuous assessment.

QUANTITATIVE SKILLS FOR THE LIFE SCIENCES (LIFE113)

Credits: 7.5 / Semester: semester 1

For any student studying the Biological Sciences a firm grasp of quantitative skills is an absolute necessity. This module will provide you with the knowledge and skills you need to manipulate numbers and analysis/visualise data using digital tools. The module emphasises a "learn by doing" approach to the development of quantitative skills and is heavily workshop based.

INTRODUCTION TO ANIMAL HUSBANDRY (LIFE118)

Credits: 15 / Semester: semester 2

This module provides an introduction to veterinary animal husbandry in the form of lectures, a workshop on poster presentation and a mini conference where students exhibit their posters.

The module covers the basic physiology relevant to animal management; environmental considerations, nutrition and housing; the welfare of managed animals and breeding issues.

The module is assessed by continuous assessment, the poster, and by a final examination.

BIOCHEMICAL METHODS (LIFE122)

Credits: 7.5 / Semester: semester 2

This course introduces widely used laboratory concepts and practical techniques that are relevant to academic research, industry and medical applications.

INTRODUCTION TO ANIMAL INFECTIOUS DISEASES, EPIDEMIOLOGY AND PUBLIC HEALTH (LIFE126)

Credits: 15 / Semester: semester 2

The module will introduce the biology of a range of veterinary infectious diseases. Basic concepts in disease epidemiology, surveillance and control will be introduced and the effects/association diseases have on animals, society and the environment. Students will be taught in small tutorial groups by research active teaching staff to develop information on a specific disease and present their group findings as a PowerPoint presentation at a "mini-conference". The module is assessed through the presentation and a final exam.

COMMUNICATION AND STUDY SKILLS FOR THE LIFE SCIENCES (LIFE130)

Credits: 7.5 / Semester: whole session

Programme details and modules listed are illustrative only and subject to change.

YEAR TWO

Years two and three, through a range of optional modules offers the opportunity for you to explore and tailor your degree to fit your strengths, interests and career ambitions. During this second year, you will explore more advanced modules to equip you with a greater understanding of Bioveterinary science and zoology as a whole. It further focuses on developing

knowledge in these areas, and others like molecular and cellular biology, ecology and epidemiology. Year two aims to develop your ability to plan and execute experiments and to use appropriate controls to solve zoological problems and properly communicate the results.

COMPULSORY MODULES

ADVANCED ANIMAL HUSBANDRY (LIFE217)

Credits: 15 / Semester: semester 1

This module is designed to integrate and extend student's knowledge of nutrition, reproduction, genetics and breeding, behaviour and welfare and to combine this with an assessment of the environment in which animals are kept. A species approach is used in which feeding, housing, breeding and general management of several major species important in the animal industries are considered. Transfer of knowledge about principles will be expected between species to help develop a deep understanding of animal husbandry.

The module will be supplemented with on-line resources. Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed by both continuous assessments and by a final examination.

TECHNIQUES IN CELL BIOLOGY (LIFE227)

Credits: 7.5 / Semester: semester 1

This practical module aims to provide practical and theoretical experience in techniques currently used in cell biology. These techniques include assay, culture, histology and microscopy. The module is assessed through coursework and a final exam.

ESSENTIAL SKILLS FOR THE LIFE SCIENCES 2 (LIFE223)

Credits: 15 / Semester: whole session

This module will continue, extend, and broaden the transferable skills developed in Year 1. It will focus on improving the students' analytical, communication, quantitative, and employability skills. The communication skills component is assessed through a portfolio whereas the quantitative skills component is assessed through a group poster and SAQ.

ADVANCED TECHNIQUES IN ZOOLOGY (LIFE230)

Credits: 7.5 / Semester: semester 2

This module aims to provide practical experience in advanced laboratory techniques in zoology. These techniques are placed within a biological context so that students will not only learn the techniques, but also use them to answer questions about form and function of animals. The module is laboratory-based and students will work in small groups to conduct experiments and generate data that will be analysed using Excel and Minitab, SPSS or similar software. The module is assessed continuously and through an exam.

VETERINARY PARASITOLOGY AND PUBLIC HEALTH (LIFE216)

Credits: 15 / Semester: semester 2

The aim of this module is to develop knowledge of the important parasitic diseases of companion and food producing animals in the U.K. and globally, leading also to an understanding of the importance of these diseases to human and animal public health. The lectures will be supplemented with on-line resources.

Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed by two items of continuous assessment and by a final examination.

VETERINARY FORM AND FUNCTION (LIFE215)

Credits: 15 / Semester: semester 1

This module will allow students to develop an understanding of functional anatomy and physiology of the major body systems (reproductive/endocrine, cardiovascular/respiratory, musculoskeletal, nervous, and digestive/excretory) using the dog as a model species;

The module will take an integrative approach, allowing the students to compare and contrast the anatomy and physiology of these body systems with those in other species of veterinary interest and apply this knowledge to understand how disruption of these systems can result in disease;

The module will be supplemented with on-line resources;

Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module;

The module will be assessed by two summative coursework assessments.

OPTIONAL MODULES

EVOLUTIONARY BIOLOGY (LIFE213)

Credits: 15 / Semester: semester 1

This module seeks to explain how the process of natural selection underpins the origins of biodiversity.

The first part of the module will address the origins of phenotypic diversity, focussing on where heritable phenotypic variation comes from and how it shapes the evolutionary process within species (microevolution).

Having established a basic model for understanding how evolution works, the second part of the module will explain the link between microevolution and evolution above the species level (macroevolution), overviewing the major evolutionary transitions. At the end of the module, students will choose between two specialised short courses on either evolutionary ecology or molecular evolution.

The lectures will be supplemented with online resources. Students will be given guided reading, and regular formative assessment exercises that will enable students to evaluate their understanding of the module.

The module will be assessed by both continuous assessments (40%) and by a final examination (60%).

ANIMAL BEHAVIOUR (LIFE211)

Credits: 15 / Semester: semester 1

This module provides an introduction to the fundamental evolutionary principles that explain a wide range of animal behaviours. These include sexual selection and animal mating behaviours, the evolution of co-operative societies, as well as conflict and conflict resolution. The lectures will be supplemented with on-line resources. Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module. The module will be assessed by both continuous assessments and by a final examination.

THE MULTICELLULAR ORGANISM: TISSUES, DEVELOPMENT, REGENERATION AND AGING (LIFE205)

Credits: 15 / Semester: semester 1

This module aims to describe the structure and function of fundamental tissues, such as epithelial and connective tissue and of specialised tissues such as bone, muscle and the nervous system. An introduction to the mechanisms by which cells differentiate to form different tissues and regenerate following injury will be included. The processes that occur during aging will be explained with special reference to changes in key tissues and organs. The lectures will be supplemented with on-line resources, guided reading and formative assessment exercises that will enable students to evaluate their understanding of the module. The module will be assessed by both continuous assessment and by a final examination.

THE IMMUNE SYSTEM IN HEALTH AND DISEASE (LIFE221)

Credits: 15 / Semester: semester 1

The module will develop knowledge and understanding of the immune system, the molecules, cells and tissues that are involved in its function, its role in combating infection and how its dysfunction can contribute to disease.

Lectures will be supplemented with on-line resources. Problem solving workshops dedicated to case studies will be held to help students prepare for the assessments. Students will be given guided reading, and formative and summative assessment exercises held during the course will enable students to monitor and evaluate their progress and to prepare for the final assessment.

The module will be assessed by two assessments.

ENDOCRINE AND NEURO-PHYSIOLOGY (LIFE204)**Credits: 15 / Semester: semester 2**

This module aims to provide the essential background knowledge to understand key concepts in neuroscience. It covers the principles of operation of nervous system, systematic and sensory neurophysiology, excitotoxicity and behaviour. The module also provides essential background knowledge to understand the key principles of endocrinology, and how it contributes to physiological homeostasis. It covers the secretions, functions and regulation of the major endocrine glands. The module also explores the role of the nervous and endocrine systems in the integrative control of the digestive tract. The lectures will be supplemented with on-line resources. Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module. The module will be assessed by both continuous assessments and by a final examination.

CELL SIGNALLING IN HEALTH AND DISEASE (LIFE202)**Credits: 15 / Semester: semester 2**

This module will describe the molecular mechanisms that allow cells to communicate with each other;

The basic properties common to all signalling pathways will be studied and then a series of individual pathways will be examined in more detail, in the light of these general principles;

The importance of cellular signalling mechanisms will be illustrated by examining diseases (e.g. cancer, diabetes, cardiovascular disease, obesity, neurological disorders) that result from defects in these mechanisms;

The lectures will be supplemented with on-line resources. Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module;

The module will be assessed by continuous assessment

COMPARATIVE ANIMAL PHYSIOLOGY (LIFE212)**Credits: 15 / Semester: semester 2**

This module describes the physiological problems encountered by animals in their natural environments, and how these problems are overcome.

The setting is environmental, relating lifestyle and physiology to habitat and to the rigours of a potentially hostile environment.

The module will explain how the lifestyles of animals and the independence of animals from environmental disturbance are critically linked to the management of energy flow through their bodies. Physiological mechanisms will be described at all levels of organisation in relation to energetics, temperature, respiration, osmoregulation, and nitrogen excretion. Emphasis will be placed on differentiating the molecular, cellular and system levels of organisation and their integrated role in optimising animal-environmental interactions.

The module is taught through a mixture of asynchronous and synchronous sessions. The former consist of pre-recorded videos, the latter are interactive online sessions to promote student engagement and active learning. Students will also be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed by Coursework

PATHOLOGICAL BASIS OF ANIMAL DISEASES (LIFE240)

Credits: 15 / Semester: semester 2

The aims of this module are to describe the comparative pathology, cellular and immunological responses in veterinary diseases in different species and explore the cellular and molecular mechanisms that underpin them. Lectures will be supplemented with a practical session, online resources, guided reading, and regular formative assessment exercises that will enable students to evaluate their understanding of the module. The module will be assessed by a final examination.

E-BIOLOGY: INFORMATICS FOR LIFE SCIENCES (S2) (LIFE242)

Credits: 7.5 / Semester: semester 2

Many aspects of modern biology are being revolutionized by high-throughput methods that make copious amounts of data available in digital form. The aim of this module is to provide students with a practical appreciation of the nature and significance of this revolution. While the focus will be on analysis of data from areas such as genome sequencing, gene expression, and protein structure studies, the module will also look at use of such data in the context of understanding higher order phenomena within cells, such as metabolism, gene regulation, and protein-protein interaction. The module is continuously assessed.

TROPICAL ECOLOGY FIELD COURSE (LIFE222)

Credits: 15 / Semester: semester 2

This is an elective residential field course in Uganda. The aim of this module is to introduce students to the ecology of tropical ecosystems and the field techniques used to study them, through staff-led field visits, seminars and student executed field studies.

The module includes tropical ecosystem function, patterns of forest regeneration, patterns of biodiversity in the tropics, the natural history of important plant and animal taxa and primate behavioural ecology. Interactions between humans and tropical ecosystems will also be a key focus, with conservation, sustainable development, human-wildlife conflict and ecotourism also being addressed.

The module will be assessed by continuous assessments. In the event of unforeseen circumstances that prevent either individual students attending, eg illness shortly before departure, or cancellation of the trip, eg on FCO and/or University insurer advice, local alternate assessment exercises will be made available. These will predominantly be library-based, but might involve field visits where possible to practice field skills.

E-BIOLOGY: INFORMATICS FOR LIFE SCIENCES (LIFE225)

Credits: 7.5 / Semester: semester 1

Many aspects of modern biology are being revolutionized by high-throughput methods that make copious amounts of data available in digital form. The aim of this module is to provide students with a practical appreciation of the nature and significance of this revolution. While the focus will be on analysis of data from areas such as genome sequencing, gene expression, and protein structure studies, the module will also look at use of such data in the context of understanding higher order phenomena within cells, such as metabolism, gene regulation, and protein-protein interaction. The module is continuously assessed.

MOLECULAR SCIENCE (LIFE237)

Credits: 7.5 / Semester: semester 1

This module is a 6 weeks molecular biology practical to provide experience in techniques to isolate, clone and analyse genes (analysis of DNA fragments by agarose gel electrophoresis, PCR, transformations, plasmid DNA preparations, gene cloning). The module has a range of different formative and summative assessments to include in-course problem-solving exercises, online quizzes and abstract writing, which ensure the student becomes confident to continue genetic manipulations in specialist Year 2 Semester 2 practical modules and for project work in Biochemistry, Genetics and Molecular Biology. The module will encourage confidence, teamwork and communication through active learning in lectures and practicals centred around authentic assessments.

ADVANCED TECHNIQUES IN ANIMAL BEHAVIOUR, HEALTH AND WELFARE (LIFE239)

Credits: 7.5 / Semester: semester 2

The aims of this module are for students to gain skills in assessing animal health and relate this to measuring behaviour, physical condition and welfare. The module will be supplemented with on-line resources. Students will be given guided reading, and regular formative feedback will enable students to evaluate their understanding of the module. The module will be assessed by producing a final report of protocols.

ADVANCED GENETICS TECHNIQUES (LIFE226)

Credits: 7.5 / Semester: semester 2

This practical module aims to provide practical experience in a range of genetic techniques including the production and characterisation of specific deletion mutants, mutagen screening, cytogenetics and karyotype analysis, population studies, molecular analysis of genomes and bioinformatics. This module is required for students intending to enter the Genetics Honours School. The module is continuously assessed.

Programme details and modules listed are illustrative only and subject to change.

YEAR THREE

Year three compulsory modules will explore in detail: animal dysfunction, disease and the role of neuro-musculoskeletal cells and biochemical events, enabling learning how to solve complex and novel problems.

In addition, you will select two optional modules from a broad range, tailored to your own areas of interest.

Collectively, you will develop advanced public engagement skills, communication of scientific findings using a variety of formats, building transferable skills in critical thinking and interpretation of data in the context of bio-veterinary science. These skills will be developed during a placement at a commercial, research or voluntary organisation.

COMPULSORY MODULES

ANIMAL NERVOUS AND MUSCULOSKELETAL DISORDERS (LIFE344)

Credits: 15 / Semester: semester 2

This module will address the cellular, molecular and biochemical basis of a number of disorders in animals.

The latest science underpinning these conditions will be examined through case studies explained by experts in the relevant fields.

Students will be assessed by both in-course and final exam written assignments .

BIOLOGY OF VETERINARY PATHOGENS: LESSONS FOR DISEASE CONTROL (LIFE367)

Credits: 15 / Semester: semester 1

The aim of this module is to provide an overview of major veterinary pathogens and modern approaches to their control and diagnosis, with a particular emphasis on the societal impact of infectious diseases of livestock. Lectures will be supplemented with laboratory practicals. To support independent learning, online resources, guided reading, and formative exercises will be provided. The module will be assessed by continuous assessment and a final examination.

RESEARCH PROJECT (LIFE363)

Credits: 30 / Semester: whole session

This module provides students with experience in the planning, design, and execution of a research project in the area of their programme discipline. The project will encompass a range of approaches including laboratory work, fieldwork, outreach work and data, and / or literature analysis depending on the nature of the project. Students will write an evaluative report on a relevant scientific area and work in collaboration with an academic supervisor to develop, plan, carry out, and record research work. The supervisor will hold regular discussion meetings with the student, and both will contribute to a reflective record of progress. Students will be expected to communicate their findings orally and in a variety of written formats.

VETERINARY EPIDEMIOLOGY AND PUBLIC HEALTH (LIFE328)

Credits: 15 / Semester: semester 2

This module will provide training in epidemiological and statistical approaches and methods, for applications in bioveterinary sciences, animal science and human medical science.

It addresses topics including epidemiology and clinical veterinary medicine, public health issues for farm animals, zoonoses, and food of animal origin.

The module is assessed by written examination and by continuous assessment.

ADVANCED SKILLS IN BIOVETERINARY SCIENCES (LIFE341)

Credits: 15 / Semester: semester 1

This module aims to provide a set of communication and critical reflection skills in the context of bioveterinary sciences. These skills will help students enhance the execution and presentation of their research project, prepare them for Level 6 assessments and maximise their employment and personal development opportunities. The module is taught through seminars and tutorials, but has a strong emphasis on independent learning. Learning material is provided through VITAL. The module is assessed by continuous assessment.

LIFE SCIENCES WORK BASED PLACEMENT (LIFE399)

Credits: 15 / Semester: semester 1

This module allows students to undertake an employment placement that will be undertaken during the summer-break between Year 2 and Year 3. Students will have to find and secure their own placement, which will need to be approved by the module leader beforehand. Placements will typically be 6–8 weeks. Early in Year 2 there will be an introductory event to present the module and advise students on how to search for placement opportunities. This session will be available to all students (including those who do not wish to enrol on the placement module). Students will be encouraged to search for placements during Semester 1, with the support of Academic Advisers and the Careers and Employability Service. Other seminar activities will take place during Semester 2 of Year 2 to prepare students for the placement work. More taught sessions will be delivered in early Semester 1 of Year 3, which include lectures on relevant psychological theories and research (e.g., workplace performance, leadership, motivation) and reflective group sessions on placement experience. The module will provide students with an opportunity to develop their employability skills by direct engagement in a commercial, research, voluntary or similar professional organisation that will support future plans, develop skills and graduate attributes. Module assessments include a skill audit and reflective log to be completed before and during practical work placement, and final written recommendations-to-employer report based on reflection on the placement experience of the individual student and the wider cohort, supported by relevant employability and occupational theories.

OPTIONAL MODULES

CONSERVATION BIOLOGY (LIFE326)

Credits: 15 / Semester: semester 1

This module uses research-led teaching to explore current thinking in conservation biology;

The module explores patterns of biodiversity and encourages students to critically evaluate the evidence supporting alternative explanations for the extinctions or demise of many animal and plant species;

It also enables students to critically evaluate different approaches to conserving biodiversity;

The module is taught via lectures and student led seminars, in the form of debates. To support independent learning, students will also be guided to sections of specific textbooks and expected to follow up preferences, primary and secondary sources, listed by staff.

CURRENT SKILLS AND TOPICS IN EVOLUTIONARY BIOLOGY (LIFE324)

Credits: 15 / Semester: semester 2

This module uses research-led teaching to critically examine a selection of contemporary themes in evolutionary biology.

In the first part, students will receive training in modern methods for reconstructing the evolutionary history of species and specific traits. In the second part, we will cover a range of up to date and exciting topics in evolutionary biology, delivered by staff who are experts in their field;

Here students will learn about and discuss the cutting edge of important and generally applicable areas of evolutionary thought;

The module is taught via lectures, seminars, structured discussions and computer practicals; and assessed by formal examination and continuous assessment.

CURRENT TOPICS IN ANIMAL BEHAVIOUR (LIFE322)

Credits: 15 / Semester: semester 2

This module addresses contemporary topics in animal behaviour within an evolutionary framework. It combines current experimental and field research and links behaviour to other areas including ecology, neurobiology, comparative cognition and human evolution. The module is delivered through traditional lectures and a combination of guided and self-directed reading. The module is assessed by formal examination and continuous assessment.

INTEGRATIVE COMPARATIVE ANIMAL PHYSIOLOGY (LIFE339)

Credits: 15 / Semester: semester 1

This module will provide students with an insight into physiological mechanisms underpinning adaptations to potentially hostile environmental conditions such as anoxia, toxic sulphide, high hydrostatic pressure and extreme temperatures.

It will also explore the physiological mechanisms related to homeostasis and the evolution of air-breathing, terrestriality and endothermy.

The module will take an integrative approach, considering physiological mechanisms from molecules to cells, tissues, whole animals and the environment.

The module is taught through a mixture of pre-recorded short online lectures and synchronous online seminars and is assessed by coursework.

THE BODY IN MOTION: MUSCULOSKELETAL FUNCTIONING IN HEALTH, PERFORMANCE AND DISEASE (LIFE335)

Credits: 15 / Semester: semester 1

This module addresses how the musculoskeletal system of humans and other animals functions to perform whole body tasks, such as locomotion and keeping balance.

It will focus on healthy normal functioning but also on sports performance and disease. To do this, the module will first present the basic principles from anatomy, physiology and mechanics that underly musculoskeletal functioning, and then show how these aspects apply to gait and other daily activities, see syllabus.

The module will also address all major relevant techniques.

This module very strongly aligns with the B110 programme, and most notably with the LIFE219, Human Locomotor Anatomy, module but also with LIFE218, Functional Neuroanatomy.

B110 students will see how the anatomy is used in living humans doing daily activities such as walking or running, and how such activities are being studied scientifically and clinically. That said, the module will require no prior detailed anatomical knowledge in order to accommodate for students from other programmes. Rather, the students will contextualise the new materials with their own existing knowledge .

The course will use hybrid teaching delivery with asynchronous content including pre-recorded lectures, videos, texts and interactive use of software. Synchronous sessions will introduce the course contents and provide feedback opportunities.

Summative assessment will consist of essay-style coursework and an online portfolio.

A peer forum will be set up on Canvas to help peer and self-directed learning.

Programme details and modules listed are illustrative only and subject to change.

HOW YOU'LL LEARN

You will experience a range of learning environments during your studies at Liverpool. These will include student-centred activities as well as lectures, tutorials, laboratory practicals, dissection classes, fieldwork, data handling sessions and computer workshops. Some of these activities will be performed individually, such as personal research projects, and others in small tutorial or project groups, in addition to formal lectures and workshops. You will have research staff as well as your own academic adviser for individual tuition on our acclaimed tutorial programme.

HOW YOU'RE ASSESSED

As well as factual knowledge and understanding, biologists need practical and organisational skills, and an ability to work both alone and with other people. We record the development of these abilities through continuous assessment during each semester and by final examination.

LIVERPOOL HALLMARKS

We have a distinctive approach to education, the Liverpool Curriculum Framework, which focuses on research-connected teaching, active learning, and authentic assessment to ensure our students graduate as digitally fluent and confident global citizens.

Careers and employability

As a Life Sciences graduate from the University of Liverpool, you will have an excellent set of career options ahead of you. For those committed to a career as a professional scientist, higher degrees (MBiolSci, MSc, MRes, MPhil or PhD) at the University of Liverpool or elsewhere provide a flexible set of options for further study.

In the public sector, Life Sciences graduates are in demand in research institutes, government departments, the National Health Service, forensic science and the Environment Agency. Commercial sectors that actively recruit graduates from the Life Sciences include the pharmaceutical, food, biotechnology, water and agriculture industries.

There is also an increasing demand for life scientists to contribute to the public understanding of science as journalists and information/liaison officers, in view of the ethical and environmental issues that arise, for example, by developments in molecular biology and biotechnology.

A number of routes are available for graduates to enter the teaching profession one of which is taking a postgraduate qualification (PGCE). There are significant financial inducements provided to meet the current demand for science teachers. In addition to all of the opportunities for graduates in general, including careers outside of biology (such as management, accountancy and human resources), where the skills you have obtained in our degree programmes will be of considerable benefit. Our degree programmes are also popular

routes to postgraduate Medicine, Dentistry or Veterinary Science.

Work experience opportunities

Students on our four-year MBiolSci programme have the opportunity to take elective internships abroad at our partner institutions. For example, while at universities in Thailand, students have worked on topics such as coral reef and mangrove ecology, genetics of shrimp development and new drugs for tuberculosis.

Students in their final year of the MBiolSci programme also have the opportunity to take a six-week life sciences related internship as an optional fourth year module which runs during the course of the summer prior to Year Four. Alternatively, students can spend the entire final Year Four in industry or other enterprises. Internships and placements are subject to availability.

You will have the exciting option to undertake a foreign field course in western Uganda which is available when studying a number of our undergraduate degree programmes. The 12-day trip involves study at both the Kibale National Park (10 days) and Queen Elizabeth National Park (two days).

Topics covered whilst in Uganda include tropical forest and savannah ecology, biodiversity patterns, primate behaviour and ecology, subsistence versus commercial agricultural practices, and ecotourism.

In addition there is the option of the LIFE399 Life sciences work-based placement module. LIFE399 is an optional third year module which runs during the course of the summer prior to Year Three. Students will undertake a placement to assist their personal development and employability, and will complete a skills audit, reflective log and report, based on their experience. The module is worth 15 academic credits.

Postgraduate opportunities

Many of our students decide to stay at Liverpool as postgraduate students. For further information on postgraduate study, the prospectus is now online in two formats for either research degrees (MPhil/PhD) at: liverpool.ac.uk/study/postgraduate-research or for taught courses at: liverpool.ac.uk/study/postgraduate-taught

4 IN 5 LIFE SCIENCES STUDENTS FIND THEIR MAIN ACTIVITY AFTER GRADUATION MEANINGFUL.

Graduate Outcomes, 2018-19.

RECENT EMPLOYERS

- AstraZeneca
- BBC
- Blue Planet Aquarium
- Chester Zoo
- Crown Prosecution Service
- Eli-Lilly
- Glaxo SmithKline
- Home Affairs, Security and
- International Development
- United Utilities
- RSPCA
- NHS
- Ministry of Defence
- Unilever
- Vodafone
- Public Health England
- Red X Pharma
- Royal Society of Biology
- The Environment Agency

PREPARING YOU FOR FUTURE SUCCESS

At Liverpool, our goal is to support you to build your intellectual, social, and cultural

capital so that you graduate as a socially-conscious global citizen who is prepared

for future success. We achieve this by:

- Embedding employability within your curriculum, through the modules you take and the opportunities to gain real-world experience offered by many of our courses.
 - Providing you with opportunities to gain experience and develop connections with people and organisations, including student and graduate employers as well as our global alumni.
- Providing you with the latest tools and skills to thrive in a competitive world, including access to Handshake, a platform which allows you to create your personalised job shortlist and apply with ease.
 - Supporting you through our peer-to-peer led [Careers Studio](#), where our career coaches provide you with tailored advice and support.
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Fees and funding

Your tuition fees, funding your studies, and other costs to consider.

TUITION FEES

Tuition fees cover the cost of your teaching and assessment, operating facilities such as libraries, IT equipment, and access to academic and personal support. [Learn more about tuition fees, funding and student finance.](#)

UK fees	
Full-time place, per year	£9,250
Year in industry fee	£1,850
Year abroad fee	£1,385

International fees	
Full-time place, per year	£24,200

Fees stated are for the 2022-23 academic year and may rise for 2023-24.

ADDITIONAL COSTS

We understand that budgeting for your time at university is important, and we want to make sure you understand any course-related costs that are not covered by your tuition fee. This includes the costs associated with placements or internships and the optional field course in Uganda.

Find out more about the [additional study costs](#) that may apply to this course.

SCHOLARSHIPS AND BURSARIES

We offer a range of scholarships and bursaries to help cover tuition fees and help with living expenses while at university.

[Scholarships and bursaries you can apply for from the United Kingdom](#)

Select your country or region for more scholarships and bursaries.

Entry requirements

The qualifications and exam results you'll need to apply for this course.

Your qualification	Requirements About our typical entry requirements
A levels	<p>ABB</p> <p>Applicants with the Extended Project Qualification (EPQ) are eligible for a reduction in grade requirements. For this course, the offer is BBB with A in the EPQ.</p> <p>You may automatically qualify for reduced entry requirements through our contextual offers scheme.</p> <p>If you don't meet the entry requirements, you may be able to complete a foundation year which would allow you to progress to this course.</p> <p>Available foundation years:</p> <ul style="list-style-type: none">• Biological Sciences (with a Foundation Year) leading to BSc (Hons)
GCSE	4/C in English and 4/C in Mathematics
Subject requirements	<p>Biology and a second science, preferably Chemistry, at A level</p> <p>Also accepted as a second science: Environmental Science, Mathematics, Physics, Geography, Psychology, Geology and Applied Science.</p> <p>For applicants from England, where A levels in Biology, Chemistry or Physics have been taken, we will also require a pass in the Practical Endorsement</p>

Your qualification	Requirements About our typical entry requirements
BTEC Level 3 National Extended Diploma	<p>D*DD in Applied Science with a selection of preferred units in Biology and Chemistry, to include Distinction in Units 1 and 5 (Principles and Applications of Science I and II).</p> <p>For previous BTEC (QCF) qualification: D*DD in Applied Science with a selection of preferred units in Biology and Chemistry, with at least 120 Level 3 credits at Distinction.</p> <p>Please note alternative BTEC subjects are not acceptable for this programme.</p>
BTEC Applied Science unit requirements	<p>Download our BTEC Applied Science unit requirements for School of Life Sciences document for more information.</p>
International Baccalaureate	<p>33 points, including 6 in Higher Level Biology, and 5 in another Higher Level Subject</p>
Irish Leaving Certificate	<p>H1, H2, H2, H2, H3, H3</p>
Scottish Higher/Advanced Higher	<p>Not accepted without Advanced Highers</p>
Welsh Baccalaureate Advanced	<p>Accepted at grade B as equivalent to a third non-science A level at grade B.</p>
Access	<p>45 Level 3 credits in graded units in a relevant Diploma, including 30 at Distinction and a further 15 with at least Merit. 15 Distinctions are required in each of Biology and Chemistry. GCSE Mathematics and English grade C/4 also required.</p>

Your qualification	Requirements About our typical entry requirements
International qualifications	<div data-bbox="491 499 927 633" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Select your country or region to view specific entry requirements. </div> <p data-bbox="1002 499 1417 577">guaranteed a place on your chosen course.</p> <p data-bbox="491 667 927 1081">Many countries have a different education system to that of the UK, meaning your qualifications may not meet our entry requirements. Completing your Foundation Certificate, such as that offered by the University of Liverpool International College, means you're</p>

ALTERNATIVE ENTRY REQUIREMENTS

- If your qualification isn't listed here, or you're taking a combination of qualifications, [contact us](#) for advice
 - [Applications from mature students](#) are welcome.
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THE ORIGINAL

REDBRICK