

**City College Norwich
Higher Education: Programme Summary Specification**

This Summary Programme Specification sets out the essential features and characteristics of the BSc (Hons) Zoology course.

Course Title	BSc (Hons) Zoology
Awarding Body	University of East Anglia
Level of Award	Level 6, Undergraduate
Professional, Statutory and Regulatory Bodies Recognition	
Credit Structure	120 credits at Level 4, Level 5, and Level 6: 360 credits in total
Mode of Attendance	Full-Time
Standard Length of Course	3 Years
Intended Award	BSc (Hons): Bachelor of Science
Fall-back Awards	Certificate of Higher Education: 120 Credits Diploma of Higher Education: 240 Credits
Entry Requirements	Our typical offer is 64 UCAS tariff points from A levels or equivalent. A minimum of GCSE Maths, English and Science (preferred) grade 4/C or above. UCAS points from Scottish Highers or Advanced levels are accepted. UCAS tariff points from BTEC or City and Guilds diplomas are accepted. Open University credits in lieu of A levels. Access to HE (Higher Education) Diplomas at Pass level, or above, and with suitable science credits.
Delivering Institution(s)	Easton College
UCAS Code	C300

Course Summary

This BSc (Hons) Zoology is designed to meet the needs of students who wish to gain knowledge and understanding of the breadth of zoology within an academically challenging yet supportive environment.

Our aim is to produce confident, knowledgeable, and questioning graduates with the skills and experience needed for a wide range of careers.

Students will be expected to integrate information and concepts from zoology, ecology and conservation, animal science and professional skills at early levels but will be given opportunities to develop specific/more focussed areas of study in their second and final year, as this will enhance their employability in certain sectors. Teaching and learning methods will include a mix of conventional lectures and practical classes, which cover the core subject matter and technical skills, supported by tutorials and seminars which allow students to develop, analyse and present their own findings. Practical classes in the laboratory and/or field allow students to practice project management and data gathering, handling and interpretation skills. All students will have the opportunity to conduct independent research in their final year research project and will have opportunities to direct their curriculum at other points in the syllabus. A varied assessment diet has been designed to encourage and test the development of the skills and knowledge needed in their future careers. Students will be supported throughout their degree by a strong personal tutoring system.

Course Aims

This programme aims to equip students with skills, knowledge, and confidence necessary to pursue graduate careers in the biological sciences or other areas requiring graduates with strong analytical, communication and enquiry skills. This will be achieved by providing students with an educational framework in which they can develop their knowledge and understanding of the fundamental principles of zoology in a context where skills development is encouraged and supported as an integral part of the academic experience. Students will be encouraged to learn independently and to pursue areas they find particularly interesting in an enquiry-based approach.

Course Learning Outcomes

Knowledge and Understanding

On successful completion of this programme a student will have knowledge and understanding of:

1. Molecular Biology: describe the basic reactions of life and major molecules of life especially DNA, RNA and key proteins and understand the relevance of this information to every aspect of biology.
2. Cells: Demonstrate an understanding of the structure and function of various types of cells in unicellular and multicellular organisms, the structure and function of cell membranes.
3. Understanding of the key metabolic and catabolic reactions of animals and plants, and how they are controlled.
4. Genetics: underpinning importance of genetics as the key to modern biology including the potential for genomics and other 'omics' technologies to advance our knowledge and provide solutions to problems.
5. Evolution: understand the fundamental process of natural selection and why it is the

major conceptual advance that allows us to understand life.

6. Behaviour: as response of organism to external and internal stimuli but understood within the interdisciplinary context of evolution, cell biology, physiology and ecology.

7. Growth and reproduction relate to genetics, physiology, including nutrition, and environment, and influence everything (from food production to environmental degradation to disease to evolution and more)

8. Ecology and biodiversity: understand that all organisms live within and are adapted to the wider environment containing biotic and abiotic components, and that biodiversity is unevenly distributed. Understand the crucial role that diverse organisms play in regulating ecosystem functions and how these might be threatened by anthropogenic change.

9. Zoology is interdisciplinary and ever-changing – hypotheses can only ever be refined – and knowledge is rarely fixed.

10. Change and scale – the world is changing and always has been – but scale and pace of anthropogenic scale is novel and has the potential to fundamentally change the biology of the planet.

11. Demonstrate a thorough and critical knowledge of the primary literature and cutting-edge research questions in several areas of specialism as presented in final year modules.

Subject Specific Intellectual Skills

On successful completion of this programme a student will be able to:

12. Design, manage, monitor, present and analyse critically research project work.

13. Formulate hypotheses and design appropriate experiments and projects to test them.

14. Demonstrate an understanding of key ethical issues relating to modern biology.

15. Acquire, evaluate, process, interpret and criticise information, conclusions and opinions from scientific publications and press and other media reports.

16. Demonstrate the capacity to communicate complex concepts and arguments clearly and effectively to various audiences in an appropriate manner.

17. Demonstrate the ability to think independently.

On successful completion of this programme a student will be able to:

18. Work safely and effectively in the field, in laboratories and in animal facilities.

19. Demonstrate competence in handling and statistical analysis of data gained from practical work.

20. Demonstrate an understanding of the interactions of organisms with each other and the environment.

Transferable Skills and Attributes

On successful completion of this programme a student will be able to:

21. Clear oral and written communication of scientific information to audiences with different levels of background knowledge.

22. Numeracy and ability to apply numeracy skills to a wide range of situations, including abstract application of simple mathematical models.

23. Competence in relevant information technology as needed for career path and confident about own ability to learn new IT skills within a rapidly changing environment.

24. Problem solving and critical analysis of own work, with effective personal time management.

25. Teamwork and working with others on projects, including demonstrating leadership as appropriate.

26. Positive and effective strategies to support life-long learning.

27. Confidence and self-awareness and ability to evaluate own strengths and weaknesses in the context of career choices.

The design of this course has been guided by the following QAA (Quality Assurance Agency) Benchmark and Professional Standards:

QAA Framework for HE Qualifications of UK Degree-Awarding Bodies (publication date 3 November 2014).

UK Quality Code for Higher Education:

https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/subject-benchmark-statement-biosciences.pdf?sfvrsn=21f2c881_4

Course Structure

This course comprises modules at levels 4, 5 and 6.

Module Specifications for each of these modules will be made available to students on-line at the beginning of each academic year.

The core module of Professional and Academic Skills encompasses the basic skills required for studying and succeeding at HE level in terms of writing, researching, and analysing in a manner appropriate for levels 4, 5 and 6 study. It further develops the student's skills in developing themselves as an employable and interview ready graduate.

The knowledge of this subject is increased through the emphasis of the various modules on different core academic skills such as presenting to a range of audiences, research, fieldwork, working in teams, developing ideas and solutions.

Knowledge is tested in different industry-related and relevant situations, which consolidates and reinforces knowledge and understanding in a highly contextualised manner. By varying the assessment types, a range of opportunities are provided to explore, analyse and review knowledge and skills in Zoology and related subject areas.

Underpinning fundamental analytical skills and statistical knowledge in Level 4 is initially introduced in Professional and Academic Skills familiarising students with a range of statistical tests and how to apply them. The use of statistics is reinforced and developed further in a range of modules at Level 5 and above such as Research Skill and the Level 6 Dissertation. This is linked strongly to the requirement for students to carry out their own research projects and assessments in Level 5 and then echoed in Level 6.

A theme of employability and industry awareness runs through much of the delivery in all levels of the honours degree. Although work experience is not a requirement of this programme, students are strongly encouraged to carry out industry related work including works with conservation organisations and local zoological collections. Guest speakers provide additional employment related links as well as exciting subject input. They aid to reinforce principles of employment, working with others and business organisation and structure.

Modules

Optional modules are subject to sufficient numbers and availability.

Year 1 – Level 4 Modules		
Module Title	Credit Value	Module Summary (including associated assessments)
Animal Anatomy and Physiology	20	<p>The animal body is remarkably well designed. Different parts of the body must work together in perfect harmony to maintain life. Health may seem to be the normal situation, but for the body to maintain life, incredibly complicated processes must occur. The relationship between disease and anatomy is strong. Disease affects anatomy and abnormal anatomy causes disease. Normal anatomy and physiology are essential for the animal's health, welfare and survival. The study of anatomy and physiology gives insight into each animal species and gives us the ability to influence an animal's survival, when there is dysfunction of the normal anatomy and physiology.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Examination • Scientific Report
Principles of Biology	20	<p>This module provides you with the essential background knowledge in cellular and molecular biology with an emphasis on genetics and evolution. You will become familiar with cellular structures and functions and the classification of living organisms.</p> <p>The module aims to develop your knowledge and understanding of plant and animal physiology alongside with the homeostatic processes that are essential in ensuring the survival of the organism in constantly changing environments.</p> <p>The module introduces you to the mechanisms of heredity including cell division, sex determination and the laws of inheritance. You will also examine the processes which drive evolution, the concepts of natural selection and events which upset the population genetics including genetic drifts and founder effect.</p> <p>This module aims to introduce you to, and develop, your observational and practical skills using light microscopy, breeding <i>Drosophila melanogaster</i> and using molecular techniques such as electrophoresis. These practical activities will improve your understanding and practical skills in biological science, the fundamental processes in living organisms and of contemporary scientific technologies.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Exam • Academic Poster

Principles of Environmental Science and Ecology	20	<p>This module aims to provide you with a broad understanding of the Earth's natural system and an underpinning understanding of soil and water resources is essential to the sustainable management of the local, national and global environment.</p> <p>You will explore and examine geographical climate patterns and the impact that climate change is having on global populations, ecosystem services, and the policy decisions used in mitigation.</p> <p>The module allows you to learn fundamental ecological theories in terms of the way that individuals, populations and species grow, interact and are distributed. The way in which energy is transferred through ecosystems and impacts on the length of food chains and numbers of individuals at varying trophic levels will be considered and it will further review the manner in which ecosystems alter with time and the influence of living organisms on successional processes.</p> <p>You will also have the opportunity to build practical skills in assessing environmental systems and the analytical skills to discuss the complex issues that influence resource use. Furthermore, an understanding of these principles will be key to help graduates towards following a more sustainable path in the development of policies, management plans and personal choice.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Essay • Examination
British Wildlife and Identification	20	<p>This module aims provides you with the skills and knowledge to identify a range of British wildlife and habitat types. This will include the recognition of dominant and characteristic vegetation as well as knowledge of significant plant and animal species found within each habitat. The ability to identify key species from a wide range of taxa is key to appreciating the biodiversity value of a range of habitats. You will develop an understanding of the abiotic and biotic relationships that determine the nature and diversity of each habitat. Adaptation of species to their given habitat will also be explored.</p> <p>The module develops your understanding about the strategies for conserving species and habitats in the United Kingdom The anthropogenic impacts on UK wildlife will be considered and what mechanisms are in place to protect wildlife in this country from the impacts of farming, urban development, pollution and alien species. If the</p>

		<p>multifunctional nature of land in the British countryside is to be conserved, then a balance must be found between conflicting land users.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Case study • Collection
Wildlife Management	20	<p>The number of species moving towards extinction is increasing due to many factors eg climate change, loss of habitat due to human population growth and resource removal. Habitat is lost due to urbanisation, agriculture and pollution, while individual species are treated as resources and exploited for food, medicines, pets and scientific research. If we are to maintain the Planet's biodiversity species conservation in situ must be a priority. Where species are already on the brink of extinction captive breeding programmes are often viewed as the only hope of maintaining and enhancing wild populations.</p> <p>Monitoring existing populations and habitats is critical in assessing the urgency of the issues involved in wildlife conservation and sustainable population management and techniques utilised are discussed.</p> <p>This module develops a student's understanding of the problems facing wildlife and the implications thereof. The conservation and management of wildlife in situ is considered. The issue of human intervention and its nature is reviewed, together with the ethical and legal implications of wildlife management practices.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Essay • Presentation
Professional and Academic Skills	20	<p>Professional and Academic Skills is a core module and designed to aid your success in your programme of study.</p> <p>This module aims to:</p> <ul style="list-style-type: none"> • to provide a framework of professional and academic skills at undergraduate level • to promote your recognition of the value of research, critical analysis and reporting in the context of your programme specialism • to aid in the identification and development of a developmental approach to learning and to the professional skills required for employment. <p>Assessment:</p> <ul style="list-style-type: none"> • Group Presentation • Reflective Journal

Year 2 – Level 5 Modules		
Module Title	Credit Value	Module Summary (including associated assessments)
Research Skills	20	<p>This module is designed to enable participants to further develop the learning and development skills introduced in the Higher Learning Skills module in year 1 (or its equivalent). It provides the opportunity for students to focus on practice-based research and evaluation skills. The module will develop an appreciation of qualitative and quantitative methodology, research methods and critical thinking skills appropriate to the subject area. This will provide a foundation for research at level 6.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Open book assignment • Research proposal
Behavioural Ecology	20	<p>This module will explore the inter-relationships between behaviour, ecology and evolution of animals and plants. Students will learn why organisms behave the way they do under particular ecological conditions and how they respond and adapt to changes in their environment. The principal models and theories in relation to behaviour and behavioural ecology will be examined, using case studies and examples to illustrate.</p> <p>Students will seek to explain the evolution of specific behavioural patterns and have the opportunity to undertake some original research in behavioural ecology on a selected species. This will involve experimental design, research, interpretation, analysis, and presentation of results. Through understanding key concepts of behavioural ecology students will be able to make more informed choices with regards to conservation within other subject areas such as habitat management and countryside recreation.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Examination • Experimental Project Report
Global Biodiversity	20	<p>This module provides an understanding of the phenomenon of biodiversity and investigates the factors that promote it and those that threaten it. You will explore the mechanisms by which biotic diversity is generated and explores the benefits that are associated with biodiversity. You will have the chance to discuss the threats facing biodiversity on a local and global scale and will be encouraged to explore and evaluate practical conservation measures to ensure the maintenance and enhancement of biodiversity for future generations.</p> <p>The module aims to allow you to develop an appreciation of the value of biodiversity as a resource in economic and</p>

		<p>aesthetic terms from the value of an individual organism to large scale ecosystem services/natural capital. It will provide you with a sound theoretical framework from which to assess the significance of local, national and international developments on the world's biodiversity.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Case Study • Examination
Vertebrate Zoology	20	<p>This module aims to provide you with an introduction to the origins of the vertebrate classes, to briefly outline the steps in their evolutionary history and to understand the functional aspects of their major morphological characteristics and life history features.</p> <p>Thus, the students will focus on the anatomy and physiology of vertebrates, seen from an evolutionary perspective and illustrate the diversity within the vertebrate groups when studying this subject.</p> <p>Students will be able to define and discuss the essential features of the Chordates, from which the Vertebrates evolved and will briefly identify the basic feeding, respiratory and locomotory, adaptations of fish before moving on to discuss the evolution of land vertebrates via the lobe-fined fishes and early amphibians.</p> <p>Students will explore the diversity of the amphibians, the evolution of the amniotic egg and contrasting water relations of amphibians and reptiles and study the evolutionary history of birds and mammals, the rise of endothermy, their primary reproductive and locomotory adaptations.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Drawing Report • Essay
Invertebrate Zoology	20	<p>Building on earlier study of evolution and diversity of animal life on Earth, this module provides a more focused exploration of the invertebrate classes. The evolutionary history of the subphylum will be examined along with anatomical plans of the major groups of invertebrates and links made to function.</p> <p>In this module you will have the opportunity to examine the comparative biology of invertebrates in an evolutionary and phylogenetic context with an emphasis on functional morphology.</p> <p>You will study topics such as an introduction to invertebrate systematics and different classification methods, an overview of systems used for locomotion, nerves, sensory perception, feeding, digestion, excretion, growth, circulation, respiration, and reproduction.</p>

		<p>Assessment:</p> <ul style="list-style-type: none"> • Drawing Report • Essay
Introduction to QGIS	20	<p>This module will provide students with valuable practical skills in the use of Geographical Information Systems through the understanding of the concepts and training during practical sessions (two third of the face-to-face teaching time). Students will discover, using relevant case studies, how to use Open-Source software (QGIS). Students will also explore a variety of resources for spatial data at both local and global scales including species distribution, protected areas, habitats maps, satellite images, etc. Students will learn how to collect spatial data in the field using GPS and tracking devices, how to manage and insert these data into QGIS, how to explore and analyse the data and how to create high quality cartographic and non-cartographic outputs. The practical sessions will cover a variety of techniques on how to use, analyse and represent available spatial data relevant to the study of terrestrial and marine organisms in the context of ecological and behavioural studies and wildlife conservation.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Essay • Scientific Report

Year 3 – Level 6 Modules

Module Title	Credit Value	Module Summary (including associated assessments)
Animal Social Behaviour	20	<p>Animal behaviour is a popular study for biologist and zoologists providing insights into the ways animals survive and reproduce within their dynamic environments. This module further focuses into the suite of interactions that occur between two or more individual animals. This could be animals of the same species where they form simple groups, cooperate in sexual and parenting behaviours, engage in territorial disputes, access suitable mates or cross spaces. It may also include interspecific interaction.</p> <p>In this module you will examine and assess the neurobiology and endocrinology surrounding social behaviours. This builds on modules and topics from Level 4 and 5 of your study in anatomy and physiology and behavioural ecology.</p> <p>You will have the chance to explore a range of species and their interactions in domestic, captive and wild settings underpinned by theories and research. The module allows you to explore a range of social species and further hone your knowledge and practical ability in designing and</p>

		<p>undertaking experiments to analyse social animal behaviour.</p> <p>By studying this module, you will be further equipped for post graduate research or employment in the wildlife, conservation and zoology industries with skills and knowledge linking social behaviour to the successful welfare, conservation and management of social species.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Examination • Report
Animal Environmental Physiology	20	<p>Environmental animal physiology investigates how animals function in different environments—from deep seas to seashores, from the top of mountains to lakes or deserts. Virtually every aspect of any environment that we could consider impinges on an animal’s physiology: its existence, its ability to obtain food and energy, its dispersion or migration, and its reproduction.</p> <p>Environments are rarely constant, particularly on land, and to survive animals must cope with whatever changes they meet. Environmental physiology explores how animals respond to environmental changes, whether these occur daily, seasonally, or as long-term trends that could affect populations.</p> <p>To understand how animals function, we need to know the mechanisms by which organs, such as the heart, kidneys, and muscles, function and how these are controlled by nerves and hormones.</p> <p>These topics will be studied via a range of lectures, laboratory, and field sessions, to understand why animals occur in certain ecosystems, while others do not.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Exam • Investigative Report
Dissertation	40	<p>This module allows students to work on an academic research project of their own choosing, utilising evidenced based methodologies and using appropriate research tools. This research project could be completed in conjunction with local businesses/charities, as well as either student utilising existing data, collecting their own data or undertaking an evaluative project. Each student will be allocated a supervisor who will advise on choice of topic and on the progress of the work.</p> <p>Students will be encouraged to use the research project as a summative exercise. Through which to evaluate their own academic progress during the degree programme. The dissertation may take the form of either a discursive,</p>

		<p>structure and evaluative thesis or a data-based project. Learners completing a project will be given an opportunity to envisage, design, and implement a piece of research that will entail collecting, analysing, and interpreting original data in the light of extant knowledge. It will also provide them with practical skills in participant recruitment, research ethics and design, project management, data analysis, and communication that will galvanise their employability profile.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Report • Presentation
Conservation Biology	20	<p>Conservation Biology is the scientific study of biodiversity with the aim of protecting species, habitats and ecosystems. In this module students will review biodiversity and its importance. Threats to biodiversity will be critically analysed within the context of sustainability. Global climate change is a significant factor affecting the distribution of the flora and fauna of planet Earth. Maintaining biodiversity with a growing human population must be a priority. Recent research suggests that the Earth is experiencing its sixth mass extinction event in its history and much of this is attributed to habitat degradation arising from human development and overexploitation of the Earth's resources. Some species are more vulnerable to extinction than others. In this module students will review the drivers of extinction utilising the IUCN Red List and other conservation assessment tools to assess the conservation status of individual species and to identify which species to save. The ethics of saving only charismatic species, umbrella species and flagship species versus saving other species will be examined.</p> <p>There are a range of conservation management strategies, and some are more successful than others. Students will appraise the features of effective conservation programmes and identify reasons for failures of others. Methods for measuring outcomes in conservation will be critically analysed. Animal welfare is a significant factor in saving species from extinction. Students will explore which aspects of animal welfare are fundamental to the success of captive breeding programmes. Comparing and contrasting issues and case-study examples from in-situ and ex-situ breeding programmes will enable students to justify the most effective approaches for breeding animals in captivity for conservation. The vital roles of population structure and genetic diversity will be evaluated alongside welfare aspects within the context of releasing animals from captive breeding programmes into the wild to create sustainable wild populations. Field study excursions to a range of collections will support research into welfare and population management. Through understanding the processes involved in breeding and managing captive species, students will be encouraged to question traditional and modern techniques in conservation. The core of the</p>

		<p>module will be delivered by Easton campus staff together with significant input from practicing researchers and practitioners in conservation. Guest speakers from ancillary businesses, conservation projects and charities will also be involved.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Field Study Report • Essay
Science Communication for Conservationists	20	<p>This module aims to give students an understanding of how modern science is disseminated to the public via a range of science communicators and how science is communicated to governments, politicians, and policy makers.</p> <p>Students will examine strong and poor strategies for communicating science to various audiences and how science information and misinformation can be used to change public perception. Students will examine the role of written press, TV, radio, websites, blogs, etc. and using case studies, will look at the approach of the press and the impact on the public and government policy. Examples utilized will be current within the industry and research fields, which may include topics such as climate change, land management, biodiversity loss, rewilding, and invasive species. Students will use reflections on these strategies to create select forms of media to engage a range of audiences.</p> <p>This module aims to provide students with a series of multidisciplinary skills for use in industry and academia. Continuous technological advancements mean that animal scientist roles can range from field work to marketing and liaising with the public or government officials. By providing students with the opportunity to analyse communication strategies and create their own targeted media, they will be appropriately skilled to meet the demands of future employers.</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Presentation • Multimedia and Reflection

Awards

On successful completion of the course, students will be awarded a **BSc (Hons) Zoology**.

Course Delivery

The full BA programme will run over 3 years with students attending two days per week.

Each 20-credit module will contain 48 hours of lectures/tutorials with students expected to undertake around 152 hours of private study. Students also receive 3 hours of personal tutoring per year. Students will complete 120 credits per academic year and therefore the programme will be full time. The contact hours will be a mix of lectures, seminars, simulated skills, and workshops.

The course is mainly delivered at Easton College, Bawburgh Road, Norwich, NR9 5DX.

Course Assessment

Assessment methods will include exams, assignments, posters, practical's, and presentations.

Course Team

The academic staff delivering this course are drawn from a team that includes teaching specialists and current practitioners. All staff are qualified in their subjects with their own specialist knowledge to contribute.

Course Costs

The tuition fees that new students pay will be fixed for the duration of the course and will not be subject to any further increases.

Payment of tuition fees is due at the time of enrolment and is managed in accordance with the Course Fees & Eligibility Statement and Rules and Regulations.

Students are likely to incur other costs for books, printing, and other learning materials they may choose to buy, and the cost incurred for printing two copies of their final year dissertation. This should amount to a total of not more than £300 per year.