



# BSc (Hons) Zoology with Entomology

<b>UCAS code</b>	Z002
<b>Institution code</b>	H12
<b>Duration</b>	4 years (full-time) including a one-year work placement. A three year programme is available for applicants with at least two years, full-time relevant work experience.
<b>Start date</b>	September 2021
<b>Location</b>	<a href="#">Harper Adams University campus</a> (and location of work placement)

## The course

This is the only zoology degree in the UK that allows you to specialise in entomology, in which Harper Adams excels. Entomologists are scientists who study insects – their classification, behaviour, life cycle, ecology, distribution, physiology and population dynamics.

However, this being a broad-based degree, you will study all animals, from farm livestock, companion animals and exotics, to UK wildlife such as insects. There's a strong emphasis on field and laboratory work – both skills in demand by employers. Understanding species and their communities gives an insight into both human and animal life and how they can be sustained in the face of global challenges, from climate change to food security.

Here at Harper Adams you'll study whole organisms, not just species at the molecular level. You'll look at animals' physiology, behaviour, and how they interact with other species and their environments, in order to preserve important habitats and manage wildlife in light of climate change.

Zoologists and entomologists protect endangered species and wildlife from the dangers of habitat loss, disease, invasive species, and climate change, and to protect and learn more about human life in the process.

You'll be taught by entomologists, conservationists, animal scientists, environmental specialists, veterinarians and many more highly experienced staff.

## Duration

4 years (full-time) including a one-year work placement. A three year programme is available for applicants with at least two years, full-time relevant work experience. Please contact [Admissions](#) for further information on this option.

## A-level entry requirements

- Offers tend to be in the region of **104** UCAS points (min 3 x A2 passes)
- Students should typically be studying **3 subjects at A2 level** to be considered
- An understanding of a biological science based subject, for example Biology, Human Biology, Applied Science or Physical Education would be preferable. We would welcome applications from candidates offering other evidence of their suitability for this programme
- When combining qualifications no more than one Subsidiary Diploma or Diploma (or comparable

qualification such as an Extended Certificate) will be considered alongside A levels (two A levels for BSc)

- General Studies and Critical Thinking are encouraged but **not** included in grades required
- Applicants are encouraged to gain experience working with a number of different animals in different settings. Applicants should include details of this in their application. Experience of different animals will enable reflection and will help with many aspects as students' progress through the course.
- **4 GCSEs at grade C/4 or above**, including English Language, Maths and a Science
- Applicants can expect to receive offers including specific grades in specific subjects (for example, a B or C at A level, or an M or D for BTEC modules)
- Key Skills (and other level 2 variants) and First Certificates/Diplomas are not accepted in place of GCSE passes
- Overseas applicants please check our [English Language Requirements](#)
- The majority of candidates will not be called for an interview and a decision will be made via UCAS Track. However, for some students a telephone interview or campus based guidance session will be required. We will simply want to meet you to understand if the course is the right choice for you and to discuss your application in more detail. We will be keen to know your reasons for choosing the course and your career aspirations.
- We have developed a range of measures and initiatives to give everyone the best chance to access our undergraduate degree programmes. The main feature of **Access to Harper** is our contextualised offer scheme. A contextualised offer is an offer which is reduced, by one grade or more from the standard entry requirement and is made to those applicants who may have experienced personal circumstances which put them at a disadvantage during their education, such as attending a low achieving school, living in an area of low participation in Higher Education or being a Care Leaver. The aim of this is to make the University more accessible for those applicants who may not have previously thought that they were eligible to apply. We have also introduced reduced entry requirements for those applicants who are over 21 years of age and further initiatives to make the application process easier for those applicants who need it.

To check if you qualify please visit the [Access to Harper](#) page.

*Note: Entry Requirements are for guidance only, please check the UCAS website or contact Admissions for further information.*

## Work placement

Challenge yourself in a real workplace during your placement year, which takes place between your second and fourth years at uni. Having chosen to specialise in entomology, this is your chance to learn from those already working in this exciting field, whether you pursue work with an organisation such as the Natural History Museum or Butterfly World, a lab-based role, or exploring agricultural pest management. Or maybe you'll take the opportunity to work with species you won't find at Harper such as zoo animals. You might work for Chester Zoo, for example, or the Durrell Wildlife Conservation. Whatever you choose, our placement team will support you both before and during your placement.

## Teaching and learning

### What you study

All Zoology students will share a common first year, learning about animal health and behaviour, and conservation. Modules will include survey and field skills, physiology, ecology, and adaptive biology.

You'll start to specialise in your second year, with two of your eight modules focused on entomology. Returning from work placement, you'll specialise further in your fourth year, with more dedicated modules and a focused research project that gives you the chance to explore a topic that interests you or furthers your career ambitions.

### Where you will study

Learning extends beyond the classroom. There will be lots of applied work in our extensive laboratories, on our commercial farm on-campus, in our entomology laboratory, the Jean Jackson glasshouse, and entomology resource room with its insect collection. There is also a Companion Animal House. You'll learn

off-site through field trips and work placement.

## **Applied field work**

You'll take part in at least two residential field courses. In your first year you will head to the Slapton Ley Field Studies Council Centre in Devon where you will learn to conduct independent field research and do a group project. There'll be an opportunity to take part in an overseas course in Spain or Portugal in your second year. In Year 4 you'll design, execute and evaluate a group research project during a further residential course on the island of Anglesey.

## **Teaching and learning**

Learning at Higher Education level is a big step up from further education so we make sure you get lots of advice and support. Everyone learns differently and in the workplace you'll need to work in different ways, so we make sure our courses test you in every way possible. So you will attend lectures and tutorials, do hands-on work, experience field trips, sit exams, and complete coursework assignments. Topics are based on real world situations, such as the reintroduction of the Wart-biter cricket and the Large Blue butterfly.

## **Assessment methods**

There will be summative assessed coursework throughout the programme, and you will receive written feedback on all course work to help you improve. End-of-module assessments will take place in May/June of each academic year. Course work may be reports, presentations or portfolios, produced individually or in a team.

## **Careers**

Entomologists are sought after and can choose from a range of interesting and rewarding careers. Some zoologists/entomologists may themselves controlling pests to make agriculture more sustainable and environmentally friendly, or to protect public health or forestry. Some graduates continue their studies to become research scientists, work as environmental consultants or nature conservationists, or in insecticide and drug development and sales. You could become a field trials officer, work in animal welfare and education, develop policies and regulations, or even find a role in the growing field of forensic entomology, using your knowledge of insect life cycles to help police solve crimes.

# What will I study?

Year	Study time (The percentage of time spent in different learning activities)			Assessment methods (This is the breakdown of assessment methods)		
	% time in lectures, seminars and similar	% time in independent study	% time on placement	Written exams	Practical exams	Coursework
1	32%	68%	0%	39%	0%	61%
2	27%	73%	0%	40%	0%	60%
3	0%	0%	100%	0%	0%	100%
4	19%	81%	0%	14%	12%	74%

Year 1	Year 2	Year 3	Year 4
Professional Scholarship Programme (PSP) 1 - Academic Skills Development (A4001C17) 15	Research Methods (Animals) (A5011C17) 15	Placement year	Honours Research Project (HRPROJC17) 30
Introduction to Ecology (C4004C17) 15	Animal Biotechnology and Genetics (A5004C17) 15		Geographical Information Systems and Land Use (C6009C17) 15
The Natural Environment and Climate Change (C4006C17) 15	Animal Ethics (A5014C17) 15		Environment and Geography Field Course (C6007C17) 15
Environmental Survey Technologies and Field Skills (C4003C17) 15	Aquatic Ecosystems (C5021C17) 15		Management of Captive Aquatic Systems (C17) 15
Fundamentals of Physiology (A4007C17) 15	Principles of Animal Behaviour and Welfare (A5008C17) 15		Population and Community Ecology (C6018C17) 15
Adaptive Biology (A4002C17) 15	Wildlife Identification and Conservation (C5011C17) 15		Invertebrate Pests and Beneficials (C17) 15
Introduction to Animal Welfare, Behaviour and Ethics (A4009C17) 15	Introduction to Entomology (C5024C17) 15		Insect Conservation (C17) 15
Principles of Animal Health (A4011C17) 15	Insect Life History Strategies (C17) 15		

## Professional Scholarship Programme (PSP) 1 - Academic Skills Development

**Year of study** 1  
**Code** A4001C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Mrs Emily Chapman-Waterhouse](#)

This module supports the development of students' personal, academic, employability and self-management skills for students in the first year of their undergraduate studies. Whilst the module provides a basis for the rest of the Professional Scholarship Programme it also supports learning in every other module. The module will be delivered throughout the academic year to students on animal-health related undergraduate courses. The main rationale for a first year module of this type is to ensure all students are fully equipped for higher education and to provide space in the curriculum in which to develop relevant skills to aid progression within and out with technically oriented modules. The key themes addressed by this module include transition into higher education and beyond the first year, approaches to learning, independent study, effective communication for animal health-related vocations, reading and reviewing literature, referencing convention, using feedback for learning and using technology to enhance learning. Whilst the roots of the module are in academic skill development, learning resources and assessments will be tailored to the vocational areas relevant to students. Students will need to actively undertake a self- review of progress at regular intervals and develop action plans for self-development.

## Introduction to Ecology

**Year of study** 1  
**Code** C4004C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Nicky Hunter](#)

Ecology is about understanding the dynamic changes in individuals, populations, communities and ecosystems in relation to each other and the physical environment. This requires knowledge of the essential processes that determine the distribution and abundance of organisms and the variety of complex biotic and abiotic interactions that take place. This module is designed to provide students with a general understanding of the ecology of living systems together with an introduction to basic ecological theory. This module will include a field studies element which will deliver the practical elements of identification, sampling and analysis of data collected.

## The Natural Environment and Climate Change

**Year of study** 1  
**Code** C4006C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Simon Irvin](#)

The countryside and the quality of the rural environment are inextricably linked to studies in the natural environment. This module is designed to investigate the many aspects of the natural environment which impact on the British countryside. This will include the study of rainfall patterns in the UK and causes of climatic change, which has a marked effect on the range of natural habitats in the British countryside. The variety and nature of soils in the UK and how these affect the land quality will be considered. Conservation and the assessment, creation and management of habitats commonly found in, and around agricultural lowland sites and the impact of pollution from agricultural sources will be investigated.

- Outline the causes and effects of climatic change on the natural environment.
- Identify and assess soil relationships, including soil texture, structure, organic matter and soil processes such as erosion.
- Appraise the need for conservation of species and habitat protection.
- Recognise a variety of UK habitats and outline how these can be managed to the benefit of the environment.

## Environmental Survey Technologies and Field Skills

**Year of study** 1  
**Code** C4003C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Simon Irvin](#)

This module provides an essential understanding of the main components of applied contemporary field survey / monitoring techniques and procedures. It provides experience in the practical application of these techniques and procedures across a representative range of habitats and environments and vital awareness of risk assessment in field survey work.

The skills and knowledge gained will enable students to undertake survey and monitoring work using a range of practical methods, understand the range of techniques involved and their relative strengths and limitations and to present and interpret data in a coherent and appropriate way.

This module complements the modules at level 4: The Natural Environment and Climate Change and Introduction to Ecology and links to the level 5 module Habitat Ecology and Conservation Management. These modules are core modules for all routes accessing this module and form a fundamental knowledge

and practical base for any student entering the environmental and wildlife sector. The module content will also provide material which directly relevant to placement work undertaken by the majority of the students.

## Fundamentals of Physiology

**Year of study** 1  
**Code** A4007C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Jim Huntington](#)

This module introduces important anatomical terms and describes the concepts required to understand the processes involved in the functioning of organ systems and the maintenance of homeostasis in vertebrate species, including humans, food producing animals, companion animals and other species addressed within the programmes this module has been validated for. A broad knowledge of normal body structure and functioning provided by this module will be invaluable for students studying modules within the animal related programmes such as *Companion Animal Studies*, *Principles of Animal Health*, and *Animal Disease Sciences*. For those studying food related programmes the module will be invaluable for the study of *Well-being Through the Lifecycle* and later modules such as *Advanced Aspects of Nutrition*. This module is designed to be a prerequisite (for some courses) to either *Veterinary Physiology* or *Applied Anatomy and Physiology*.

## Adaptive Biology

**Year of study** 1  
**Code** A4002C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Professor Mark Rutter](#)

This module provides a broad overview of how the process of evolution through Darwinian natural selection has resulted in the diversity of life seen on Earth. Historic theories of evolution are evaluated, and the mechanisms underpinning evolution are explored, from microevolution, through speciation to macroevolution. The role of DNA and mechanisms of inheritance are studied, as is animal taxonomy. The evolution of humans is considered, along with the history and process of animal domestication. The effects of evolution and domestication on animal physiology and behaviour are explored. The module is designed to give the students a deeper understanding of evolution and its role underpinning the biological sciences.

## Introduction to Animal Welfare, Behaviour and Ethics

**Year of study** 1  
**Code** A4009C17  
**Credits** 15  
**Core/option** Core

This module will introduce students to the science of animal behaviour and the importance of behaviour in our understanding of animal welfare. It will also consider the ethics of society's usage of different types of animals and the role of legislation and different organisations in the promotion of the interests of animals. Examples will be drawn from a range of diverse species and scenarios to illustrate the principles and practices discussed.

The content of this module will be of benefit to anyone considering working either directly or indirectly with animals in a range of environments. An appreciation of the science of animal behaviour and welfare and how underlying ethical values may influence the acceptability of animal use, will enhance the ability of the individual to undertake welfare assessments of the animals they are responsible for. The knowledge and understanding gained in the module will be an important foundation for those going on to study the module *Principles of Animal Welfare and Behaviour*.

## Principles of Animal Health

**Year of study** 1  
**Code** A4011C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Malgorzata Behnke](#)

The immune system of domestic animals faces challenges from micro-organisms and parasites on a daily basis. Furthermore, the general public are at risk from zoonotic micro-organisms and parasites from the animals they keep and come in to contact with.

This module aims to develop students' knowledge and understanding of the micro-organisms and parasites that are important in animal health and the processes by which animals defend themselves against invasions of foreign organisms. This provides a crucial first step in understanding how these diseases can be controlled and will facilitate future learning in other modules which focus in more detail on control measures. Zoonotic risks are highlighted to enable students to identify at-risk situations and populations.

## Research Methods (Animals)

**Year of study** 2  
**Code** A5011C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Stephen Mansbridge](#)

The ability to collect, analyse and interpret data appropriately is a core skill for all those involved in modern animal science. In view of this, research skills are important to enable the critical appraisal of published research, and for the development of appropriate study designs to fulfil research objectives. This module forms part of the Professional Scholarship Programme (PSP) and is taken by all BSc and MSci students studying animal programs. The skills gained within this module are essential for the completion of the level 6 / 7 research projects in the final year. Students will learn valuable skills covering critical literature reviews, the importance of research designs and protocols in the context of quality assurance schemes, data collection / analysis and presentation of information. By carrying out statistical analysis using appropriate software during tutorials, the students will develop their ICT skills and further their understanding of the role of statistics in the research process.

## Animal Biotechnology and Genetics

**Year of study** 2  
**Code** A5004C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Sandy Mackenzie](#)

This module develops the principles of animal breeding, genetics and biotechnology. It will cover the application of current biotechnology technologies used to enhance animal production, health and breeding. The knowledge gained from this module leads on from Bioscience for Agriculture and Animal Production Systems and complements other modules in which the key features of biotechnology and genetics are discussed.

## Animal Ethics

**Year of study** 2  
**Code** A5014C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Mr Stephen Baugh](#)

Most of us interact with animals on a daily basis, whether that be via our pets, via commercial animals in a work environment or through the animal products that most of us eat. Through these interactions animals are treated by humans in particular ways dependent on many factors including species, utility, religious or cultural beliefs and beliefs based on an animal's sentience or intrinsic value. This module considers our interactions with animals and explores the challenges we face when making moral judgements about how we utilise and treat animals. We will consider many questions that underpin our beliefs about other species and our interactions with them. How should we treat animals? Is it acceptable to use animals for our own benefit? Do animals have intrinsic value? Do animals have rights?

The main ethical theories that are useful when exploring these issues are discussed and explained and examples of how these theories can be applied to our interactions with animals are discussed.

## **Aquatic Ecosystems**

**Year of study** 2

**Code** C5021C17

**Credits** 15

**Core/option** Core

**Module contact** [Dr Lucy Crockford](#)

About 70% of the planet is covered by water, but we know surprisingly little about the organisms that live in the different aquatic systems. This module aims to introduce students to the important disciplines of marine and freshwater ecological studies while developing relevant specific skills, knowledge, and experience among them. These skills and knowledge will be applied to investigate the increasing observed global change both natural and anthropogenic on aquatic ecosystems. With the increasing governmental, private, and societal interest in aquatic sciences, there is a growing demand for graduates with expertise in freshwater and/or marine ecology.

This module will focus mainly on freshwater habitats and the animals that live in them or make a living from them, but marine habitats will be considered where appropriate.

## **Principles of Animal Behaviour and Welfare**

**Year of study** 2

**Code** A5008C17

**Credits** 15

**Core/option** Core

Their complex behaviour is one of the main factors that distinguish the Animalia from the other Kingdoms of Life. This module aims to explore the richness and diversity of the behaviour we see in the animal kingdom, considering the various factors that have influenced its evolution. Although there will be an emphasis on the more complex behaviour patterns seen in the higher animals, this module will consider the behaviour of animals in general, and will not focus on just the domesticated species. This diverse approach will help in the understanding of the general principles which underpin the development of the various patterns of behaviour we observe in animals.

Animal welfare is of major concern to those working in the animal industry as well as the general public. In this module, students are encouraged to consider the issues that affect the welfare of many groups of animals such as farm, companion, zoo and research animals. The physiological and behavioural changes which occur when welfare is compromised will be studied and how these may be used to assess an animal's welfare status. The philosophical and ethical considerations of how we use animals will be discussed and an overview is given of the legislation which governs animal welfare across a range of species.

## **Wildlife Identification and Conservation**

**Year of study** 2

**Code** C5011C17

**Credits** 15

**Core/option** Core

**Module contact** [Nicky Hunter](#)

This module aims to provide students with an extension of knowledge from the level 4 ecology module and to focus primarily on the synthesis and analysis of the ecological requirements of species and habitats, and the issues around conservation and funding currently in the UK. In order to fully understand the ecology of species, correct identification and adaptation features for the major groups of fauna and flora needs to be recognised.

A practical knowledge and skills-based understanding of the selection and use of identification keys and community classification systems is one of the corner stones to effective assessment of biodiversity for conservation. Students will develop practical knowledge of, and skills in, the use of species identification techniques. Particular attention will be focused on species that are associated with the UK countryside, but the module will also address globally applicable general principles and concepts. Essentially a hands-on approach to learning is encouraged introducing students to the flora and fauna found in a range of habitats which will reinforce the competences of survey skills studied previously.

## Introduction to Entomology

**Year of study** 2  
**Code** C5024C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Professor Simon Leather](#)

Insects make-up about 70% of all animal species and are important components of all terrestrial and freshwater ecosystems. It is, therefore, essential that those working in the field of entomology have a working knowledge of and ability to identify species belonging to the major insect groups. This course will address this requirement by introducing the biology and systematics of the major insect groups.

This module will also highlight the crucial role that taxonomy plays in agriculture, pest management and conservation. A brief outline of what is taxonomy, what are species and the tools taxonomists use will also be provided.

## Insect Life History Strategies

**Year of study** 2  
**Code** C17  
**Credits** 15  
**Core/option** Core

Please contact the course manager for details of this module.

## Placement year

**Year of study** 3  
**Core/option** Core

Read our dedicated [Placement Learning](#) pages for information on the many benefits of the placement year.

## Honours Research Project

**Year of study** 4  
**Code** HRPROJC17  
**Credits** 30  
**Core/option** Core

To qualify for an honours degree a student must demonstrate the capacity for sustained, independent and high quality work. One of the most important vehicles for the demonstration of this capacity, and for developing the necessary skills, is the individual Honours Research Project. Each student will therefore be required to complete such a project under the general supervision of a member of staff and present the

results in a project report and in a *viva voce* exam, with two tutors, which will also test to a high level, skills of communication and rational argument. This major exercise represents one-quarter of the final year studies and will therefore have an important influence on the classification of award.

## **Geographical Information Systems and Land Use**

**Year of study** 4  
**Code** C6009C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Andy Wilcox](#)

Land management is a complex process involving a combination of agricultural, environmental, recreational and social issues. Geographical Information Systems (GIS) allow storage, analysis and dissemination of spatial information are an essential tool for resource management. This module will provide students with an overview of GIS theory, application and software and allow students to develop practical skills relating to spatial data capture, analysis and presentation using the ESRI ArcGIS platforms.

## **Environment and Geography Field Course**

**Year of study** 4  
**Code** C6007C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Andy Wilcox](#)

Sustainable solutions to environmental problems are often complex and require a combination of different disciplines in order to achieve an acceptable outcome. Typically, such activities are carried out by a single project team or collection of project teams that each offer their own area of expertise to the solution. This module allows students to develop their high level skills and abilities by undertaking a team project based on a real situation or issue. The project will be focused around a residential field course and combine elements of the entire CEWG portfolio, including aspects of countryside, environmental and geographical management.

## **Management of Captive Aquatic Systems**

**Year of study** 4  
**Code** C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Tharangani Herath](#)

Please contact the course manager for details of this module.

## **Population and Community Ecology**

**Year of study** 4  
**Code** C6018C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Andrew Cherrill](#)

This module is designed to develop a knowledge of population and community ecology, and the practical skills required to engage in field and laboratory studies of these fundamental entities. Population ecologists study the ecology of single species populations and the interactions between individuals within the population and with the abiotic environment. Key questions are relative importance of abiotic factors and within-population processes in determining species distributions and abundance in time and space.

Community ecologists expand these investigations to include the ecological patterns and dynamics of assemblages of populations of two or more species co-occurring. Key problems are elucidating the mechanisms of coexistence of competing species, 'community assembly rules', predator-prey relationships, biological control of pests, plant-animal interactions, and the importance of understanding these processes in the applied fields of Integrated Pest Management, conservation and environmental management.

## **Invertebrate Pests and Beneficials**

**Year of study** 4  
**Code** C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Tom Pope](#)

Please contact the course manager for details of this module.

## **Insect Conservation**

**Year of study** 4  
**Code** C17  
**Credits** 15  
**Core/option** Core

Please contact the course manager for details of this module.