

# Zoology

How animals live and why they live that way are questions addressed by zoologists. Most of the Australian fauna are poorly understood or not even formally named, yet informed management and resource use of Australia's flora, fauna and habitats depend upon zoological knowledge. We need to catalogue what species exist and how they survive in their natural environments. This requires knowledge of their physiology, breeding and reproductive systems, ecology, evolution and behaviour.

Students enrolled in zoology subjects can learn a diversity of topics, ranging from the structure and function of the cells that make up animals, through anatomy and physiology, reproduction and development, evolution, ecology and behaviour. This knowledge is important for biomedical research, agricultural and fisheries practices, the management of natural resources, environmental planning and for understanding the natural world.

Graduates with majors in zoological subjects find employment in the public and private sector in a wide range of biomedical, environmental, fisheries and wildlife fields. Their studies provide students with specialised knowledge about animals and their environment, which will allow students in the workforce to make informed decisions, and/or to accumulate more knowledge by further research. Students will also gain experience with a variety of technical analytical equipment and obtain several generic skills, including the ability to:

- evaluate critically scientific evidence;
- develop research projects;
- organise and analyse data; and
- develop written and oral communication skills.

Zoology graduates have gained employment in secondary and tertiary education; museums; Federal and State instrumentalities, such as CSIRO, National Parks and Wildlife Service and State Departments of Natural Resources; organisations specialising in medical (eg. Department of Health, hospitals), biomedical, veterinary, agricultural, fisheries, aquaculture and industrial research; companies dealing with environmental, conservation and wildlife management; and the media (eg. ABC Natural History Unit). Additionally, you may wish to gain further research experience by undertaking a higher degree in zoology, which will provide you with opportunities to pursue independent research interests.

Students who are interested in zoology are strongly recommended to include a core of four zoology subjects in their selection of 200-level science subjects: 654-201, 654-202, 654-203 and 654-204. These provide an essential basis for completing many of the majors offered by the Department of Zoology. The majors cover the broad spectrum of zoological subjects and include:

- zoology;
- conservation and Australian wildlife;
- ecology;
- marine biology.
- reproduction and development

Students can add further breadth to their degree by undertaking a second major in environmental science, or other subjects offered by the Department of Zoology or other departments (eg. anatomy and cell biology; biochemistry and molecular biology; botany; earth sciences; genetics; anthropology, geography and environmental studies; physiology; and psychology). You may also pursue your own research interests in zoology more extensively by enrolling in a Research Project subject.

Students who are interested in a particular subject but do not have all the prerequisites are encouraged to contact the coordinator of that subject. We recognised that students come to zoology from a wide range of backgrounds and we may waive prerequisites in some cases.

## Bachelor of Science (Degree with Honours)

For information about the faculty and department entry requirements for honours, please refer to *Bachelor of Science (Degree with Honours) and Bachelor of Information Systems (Degree with Honours) (p.1)*. These requirements should be considered when planning your course.

## Further information

More extensive subject descriptions and email addresses of subject coordinators can be found on the Zoology website.

Department of Zoology  
The University of Melbourne  
Victoria 3010  
Tel: +61 3 8344 6244  
Fax: +61 3 8344 7909  
Web: <http://www.zoology.unimelb.edu.au>

## Subject descriptions

### 200-level subjects

#### 654-201 Invertebrate Structure and Function

**Note:** Formerly known as 654-201 Animal Diversity.

Experiments involving the use of animals are an essential part of this subject; exemption is not possible.

**Availability:** This subject is likely to be quota-restricted this year, see *Quota subjects (p.9)*.

**Credit points:** 12.5

**Coordinator:** Dr R Day; Prof D L Macmillan

**Prerequisites:** Biology 650-141 and 650-142; or 650-131 and 650-132 (prior to 2004: biology 600-141 and 600-142; or 600-131 and 600-132).

**Contact:** 24 lectures (two a week) and 27 hours practical work; and up to six hours of excursions, tutorials and demonstrations (*Semester 1*).

**Description:** Upon completion of this subject students should have:

- an appreciation of the range and diversity of the main groups of invertebrate animals;
- the relation between structure and function in invertebrate animals; and
- an understanding of current views about the phylogenetic relationships between the groups.

Structural, physiological, behavioural and evolutionary aspects of the biology of invertebrate groups are covered. The practical component will cover the taxonomy and morphology of the major invertebrate groups. Students should develop the ability to recognise and classify the main groups of invertebrate organisms and also an understanding of their morphological, physiological and behavioural characteristics.

This subject builds upon generic skills developed in first-year subjects, including an ability to approach and assimilate new knowledge and an ability to use that knowledge to evaluate theories and communicate ideas. Students should also learn how to observe critically and to use the results of their observations to pose and answer theoretical questions and to solve practical problems. They should master the terminology of a scientific field and gain experience in using that mastery to access an established body of scientific literature and material. Thus they should develop the ability to critically evaluate questions and issues in that scientific field.

**Assessment:** Assessment of laboratory notebooks and excursion reports totalling up to 1000 words (15%), additional essay work (10%) and progress tests (5%) due during the semester; a 2-hour written examination in the examination period (40%); a 2-hour practical examination in the examination period (30%).

#### 654-202 Vertebrate Structure and Function

**Note:** Formerly known as 654-202 Animal Structure and Function.

Experiments involving the use of animals are an essential part of this subject; exemption is not possible.

**Availability:** This subject is likely to be quota-restricted this year, see *Quota subjects (p.9)*.

**Credit points:** 12.5

**Coordinator:** Dr D Young

**Prerequisites:** Biology 650-141 and 650-142; or 650-131 and 650-132 (prior to 2004: biology 600-141 and 600-142; or 600-131 and 600-132).

**Contact:** 24 lectures (two a week) and 27 hours practical work; 10 hours demonstrations/excursions (*Semester 2*).

**Description:** Upon completion of this subject students should have:

- an appreciation of the range and diversity of vertebrate animals;
- an insight into the evolutionary history and relationships of the vertebrate groups; and
- an understanding of the anatomy and functional organisation of the vertebrate body.

In the laboratory component students should:

- gain a practical knowledge of the structural diversity and relationships of the vertebrates; and
- acquire skills in the anatomical and microscopical methods relevant to the study of vertebrate animals.

The subject provides an introduction to basic vertebrate anatomy and functional organisation; the diversity and relationships of living vertebrates; aspects of vertebrate phylogeny; and principal organ systems of the vertebrate body. The practical component will cover the microscopic anatomy of vertebrates; comparative studies of the vertebrate skeleton; and the gross anatomy of selected vertebrates.

This subject builds upon generic skills developed in first-year subjects, including an ability to approach and assimilate new knowledge and an ability

to use that knowledge to evaluate and communicate the ideas. Students should also learn how to observe critically and to use the results of their observations to pose and answer theoretical questions and to solve practical problems. They should gain experience in mastering the terminology of a scientific field and then in using that mastery to access an established body of scientific literature and material and to develop the ability to critically evaluate questions and issues in that scientific field.

**Assessment:** Assessment of laboratory notebooks totalling up to 1200 words during the semester (30%); a 2-hour written examination in the examination period (50%); a 2-hour practical examination in the examination period (20%).

### 654-203 Animal Physiology

**Note:** Experiments involving animals are an essential part of this subject; exemption is not possible.

**Credit points:** 12.5

**Coordinator:** Dr L Parry; Dr T Fletcher

**Prerequisites:** Biology 650-141 and 650-142; or 650-131 and 650-132.

Plus 25 points from 610-141, 610-142, 610-171, 620-160.

**Contact:** 30 lectures (three per week initially, then two per week) and 18 hours of practical work (*Semester 2*).

**Description:** Upon completion of this subject students should have:

- a solid foundation in basic physiological processes in animals;
- an understanding of how animals adapt to diverse and challenging environments.

In the laboratory components students should:

- develop first-hand experience in the design and execution of physiological experiments;
- learn how to interpret data and write scientific reports.

This lecture and laboratory-based subject deals with basic physiological processes in animals, with a focus on the different ways in which animals adapt to their environments. Particular emphasis will be placed on integration between molecules, cells, organs and organ systems, with examples taken from across the animal kingdom. Topics include endocrine feedback systems; neural integration; respiration; osmoregulation; cardiovascular systems; thermoregulation and reproduction.

The subject will build upon generic skills developed in first-year subjects, including the ability to approach and assimilate new knowledge. Students will learn how to use these skills to critically evaluate and solve practical problems in physiology.

**Assessment:** Three laboratory reports totalling up to 20 pages (25%) and five task sheets totalling up to 5 pages (5%) due during the semester; a 2-hour written examination in the examination period (70%).

### 654-204 Ecology: Individuals and Populations

**Note:** Experiments involving the use of animals are an essential part of this subject; exemption is not possible.

Formerly known as 654-204 Animal Ecology.

**Credit points:** 12.5

**Coordinator:** Dr G Coulson; Dr B Downes; Dr P Vesik

**Prerequisites:** Biology 650-141 and 650-142; or 650-131 and 650-132 (prior to 2004; biology 600-141 and 600-142; or 600-131 and 600-132); or geography 121-012 and 121-013.

**Contact:** 24 lectures (two a week) and 27 hours practical work plus a full day excursion (*Semester 1*).

**Description:** By the completion of this subject, students should have an appreciation of:

- the way in which components of the environment affect individual organisms' ability to survive and reproduce;
- the way in which populations grow;
- the consequences of environmental effects on individuals and on the distribution and abundance of populations;
- the nature of interactions between species in communities, and how these interactions affect individuals and populations; and
- the effect of natural selection on individuals and on the dynamics of populations and communities.

In the practical component students should:

- develop an understanding of the ways in which ecological research is carried out; and
- gain an appreciation of the importance of field experiments and the role and usefulness of models, including mathematical models, in ecology.

The subject provides an introduction to ecological questions that can be addressed at the levels of individuals, populations, communities and ecosystems. Topics covered include aquatic and terrestrial examples; organisms and the physical environment; life histories, population growth and regulation;

managing populations; theoretical models; and species interactions, especially competition and predation. The practical component will emphasise experimental approaches to ecology, experimental design and biometry, and how to write scientific papers.

**Assessment:** Written work as practical and excursion reports totalling up to 15 pages due during the semester (30%); ongoing assessment of practical exercises and laboratory problems during the semester (25%); a 2-hour written examination in the examination period (45%).

**Prescribed texts:** M Begon et al., *Ecology: Individuals, Populations and Communities*, 3rd edn, Blackwell, 1996.

### 654-207 Australian Wildlife Biology

**Credit points:** 12.5

**Coordinator:** Dr K Handasyde

**Prerequisites:** Biology 650-111 (or prior to 2004: 600-111) or approval of coordinator.

**Contact:** 36 lectures (three a week); 20 hours practical (including excursions) (*Semester 1*).

**Description:** This subject will introduce students to the biology of Australia's vertebrate fauna (including fish, amphibians, reptiles, birds and mammals) with an emphasis on frogs, reptiles, birds and eutherian mammals. There will be particular focus on the adaptations of the fauna to the unique and uncertain nature of the Australian environment. A variety of topics will be discussed including diversity of Australian vertebrate groups in comparison to other parts of the world; the impact of human activities and introduced animals on native fauna; wildlife diseases; venomous fauna; and the ethics associated with research and experimentation on animals.

Upon completion of this subject students would have an appreciation of the natural history and uniqueness of a broad range of Australian wildlife; and a sound knowledge of the interactions between wildlife and natural and human-modified environments.

This subject builds upon generic skills developed in first-year subjects, including an ability to approach and assimilate new knowledge and an ability to use that knowledge to evaluate and communicate the ideas. Students should learn how to observe critically and to use the results of those observations to pose and answer theoretical questions and to solve practical problems. They should gain experience in mastering the terminology of a scientific field and then in using that mastery to access an established body of scientific literature and material and to develop the ability to critically evaluate questions and issues in that scientific field. Students should also learn how to collect and interpret data in field situations and write this up as a scientific report.

**Assessment:** Written reports on practical work and excursions totalling up to 1200 words due during the semester (30%); a 2-hour written examination in the examination period (70%).

### 606-204 Ecology: Communities and Ecosystems

See full subject details on page 1.

## 300-level subjects

### 654-302 Experimental Marine Ecology

**Note:** Experiments involving the use of animals are an essential part of this subject; exemption is not possible.

**Availability:** This subject is likely to be quota-restricted this year, see *Quota subjects (p.9)*.

**Credit points:** 12.5

**Coordinator:** Prof M Keough; Dr S Swearer

**Prerequisites:** Zoology 654-201 plus 654-312 (or enrolment in 654-312 in current year).

**Contact:** Ten lectures and 50 hours practical work. Practical work will be undertaken at the Queenscliff Marine Station, operated by the Faculty of Science, over eight days in February. No more than 30 students may enrol in any year (*Summer semester*).

**Description:** This subject covers current ecological principles and concepts, particularly as they apply to the marine biota. The major focus is on experimental approaches to ecological questions, emphasising the design and analysis of ecological experiments. An important emphasis of the course is developing the ability to read and assimilate current papers in the ecological literature, and evaluating critically the arguments and data presented in those papers.

This subject builds upon existing generic skills, including an ability to approach and assimilate new knowledge from observation and the literature, and an ability to use that knowledge to evaluate and communicate results. Students should develop their abilities to pose testable hypotheses, to devise appropriate sampling procedures and experimental designs, and to work in field situations. Students should learn how to access information from the pri-

many scientific literature, through both electronic and traditional sources, and gain experience in writing scientific reports and essays.

**Assessment:** Written work totalling up to 5000 words, including a report on practical work (60%), peer-review assessment (20%), and response to reviewer's comments (20%), due during first semester immediately following the summer semester in which the subject was undertaken.

### 654-304 Reproduction

**Note:** Experiments involving the use of animals are an essential part of this subject: exemption is not possible.

Credit cannot be gained for both this subject and any of 654-314 (prior to 2005), 654-324, 208-325.

**Credit points:** 12.5

**Coordinator:** Dr G Shaw

**Prerequisites:** 25 points selected from 654-203, 654-202, 208-202, 208-207, 536-201, 536-202, 536-211, 536-233, 516-201, 516-207, 521-213, 536-250. Equivalent subjects may be accepted with the permission of the coordinator.

**Contact:** 24 lectures and 24 hours practical/tutorials (*Semester 2*).

**Description:** This subject aims to give students of science and biomedical science a solid foundation in reproductive biology and its applications. By the completion of this subject students should:

- understand the modern experimental approaches of reproductive physiology and assisted reproductive techniques;
- understand and be able to apply selected methods used in reproductive physiology, including surgery;
- understand the structure and function of male and female reproductive systems; and
- understand neuroendocrine and endocrine control systems and their role in the regulation of reproductive processes.

Topics will include structure, function, and development of the reproductive organs; endocrine and neuroendocrine and environmental control of reproduction, fertilisation, pregnancy, parturition and lactation in vertebrates; and human intervention in the reproductive process.

This subject builds upon existing generic skills, including an ability to approach and assimilate new knowledge from observation and the literature, and an ability to use that knowledge to evaluate and communicate results. Students should acquire the basic skills required to make and record scientific observations, and evaluate data in an objective manner as part of practical class report writing. They will be encouraged to access information from the primary scientific literature, through both electronic and traditional sources, and to develop the skills needed to produce scientific reports that are succinct, clear and completed on time. They should develop their abilities to evaluate scientific evidence critically, to formulate hypotheses, and be alert to alternative explanations. Students should also improve their skills in dissection and gain first-hand experience in the use of experimental animal surgery.

**Assessment:** A critical review of published journal articles totalling up to 1000 words and a group oral presentation due during the semester (15%); laboratory work, worksheets and up to three practical reports totalling up to 3000 words due during the semester (35%); a 3-hour written examination in the examination period (50%).

**Prescribed texts:** M H Johnson and B J Everitt, *Essential Reproduction*, 5th edn, Blackwells.

### 654-305 Experimental Animal Behaviour

**Note:** Previously carried the subject code 654-303.

Credit cannot be gained for both this subject and 654-303 prior to 2003.

**Availability:** This subject is likely to be quota-restricted this year, see *Quota subjects (p.9)*.

**Credit points:** 12.5

**Coordinator:** Dr R Mulder; Prof M Elgar

**Prerequisites:** 654-204 and one of 654-201, 654-202 or 654-203.

**Corequisites:** 654-315.

**Contact:** Three tutorials (6 hours) and 60 hours of practical work (*Semester 1*).

**Description:** This subject explores the techniques and methods of undertaking research in animal behaviour, including experimental and sampling design, data collection, statistical analysis of data and presentation of the research results. Students will participate in a group project, in which they will design, execute, analyse and interpret observational and experimental studies of the behaviour of animals in either natural or captive populations.

The subject builds upon existing generic skills, including an ability to assimilate and critically evaluate new knowledge within a scientific paradigm, and to communicate that knowledge to others. Students should also develop skills in managing a group research project, and in analysing, interpreting and evaluating scientific data critically. They should also gain experience in writing a

scientific report, providing and responding to peer reviews, and making an oral presentation.

**Assessment:** Written work on practical assignments totalling up to 3000 words due during the semester (90%); a 10-minute oral presentation at the end of semester (10%).

### 654-306 Marine Zoology

**Note:** Previously carried subject code 654-313 Marine Zoology.

Experiments involving the use of animals are an essential part of this subject; exemption is not possible.

**Availability:** This subject is likely to be quota-restricted this year, see *Quota subjects (p.9)*.

**Credit points:** 12.5

**Coordinator:** Prof D L Macmillan; Dr S Swearer

**Prerequisites:** 654-201 and 654-202.

For 2007, students who completed 654-201 but not 654-202 will also be eligible to enrol in this subject.

**Contact:** 12 lectures and 40 hours of practical work; six hours of excursions (the subject is held in the summer break before Semester 1) (*Summer semester*).

**Description:** Upon completion of this subject students should have:

- an appreciation of the range and diversity of the main groups of marine animals particularly those of south-eastern Australia;
- an understanding of the morphological, physiological, behavioural and developmental characteristics of selected groups; and
- an understanding of some current research issues involving marine animals.

In the practical component students should develop the ability to recognise and classify the main groups of marine animals and develop an understanding of their morphological, physiological, behavioural and developmental characteristics. The subject provides for advanced study of animal groups that are important in the marine environment. Structural, physiological, behavioural and developmental aspects of their biology are covered with particular emphasis on areas in which there is current research activity.

This subject builds upon existing generic skills, including an ability to approach and assimilate new knowledge from observation and the literature. Students should learn how to access information from the primary scientific literature, through both electronic and traditional sources, and gain experience in writing scientific reports. Students should learn the importance of careful observation and the context in which that observation is undertaken when posing and answering theoretical questions and when solving practical problems. It should assist students in developing the ability to recognise which questions relating to a topic are important and which are amenable to solution with the available tools. It should develop students' abilities to work in field situations and to integrate their observations with existing literature and knowledge.

**Assessment:** The relative weighting of assessed written work and assessed practical work will be chosen so as to maximise the student's final mark: Essays and/or reports of up to 3000 words (either 60% or 80%) and practical record (either 40% or 20%), both due during first semester immediately following the summer semester in which the subject was undertaken. The record of practical work is a description of observations and experimental results obtained during fieldwork undertaken during the summer semester; the essays and reports are submitted and assessed during first semester.

### 654-307 Evolution and the Human Condition

**Credit points:** 12.5

**Coordinator:** Prof M A Elgar

**Prerequisites:** 25 points in 200-level life sciences subjects, or by arrangement with the coordinator.

**Contact:** 24 lectures (two a week) and 16 hours excursion, tutorial or practical work (*Semester 1*).

**Description:** This subject explores the significance of contemporary evolutionary theory to our understanding of human biology. In particular, it provides students with an understanding of the evolution of adaptation by natural selection; an appreciation of the phylogenetic place of humans among primates; and knowledge of how evolutionary theory might resolve questions about the human condition.

Specific topics include the theory of natural and sexual selection; primate speciation and the fossil record; the evolution of language; the role of genetics and environment in shaping the human condition; the relevance of evolutionary theory for understanding the life-history traits, and the sexual and social behaviour of humans; the evolution of pathogen virulence and immune responses, and the application of evolutionary theory to understanding medical, veterinary, primary production and environmental practices.

The subject builds upon existing generic skills, including an ability to assimilate and critically evaluate new knowledge within a scientific paradigm, and to communicate that knowledge to a broad audience.

**Assessment:** Written essays and/or excursion report of up to 2000 words due during the semester (35%); a 2-hour written examination in the examination period (65%).

### 654-308 Conservation Biology

**Credit points:** 12.5

**Coordinator:** Dr G Coulson

**Prerequisites:** 654-204 or botany 606-204.

**Contact:** 24 lectures (two a week) and 20 hours tutorials/workshops (including excursions) (*Semester 2*).

**Description:** The subject describes and evaluates the theoretical principles and practical applications of conservation biology, and the scientific study of biological diversity. In particular, it identifies the implications of global and local changes for ecological communities and habitats, especially within the Australian environment. It also examines the role of population genetics for the fitness and viability of natural and captive populations; the patterns and explanations of diversity and rarity; the effects of habitat fragmentation and the role of corridors as a management practice; the methods of rangeland and marine management; the control of introduced species; and the impact of genetic engineering. Finally, the subject highlights the importance of statistical design for the analysis of monitoring programs and preparation of environmental impact statements.

This subject builds upon existing generic skills, including familiarity with key ecological concepts, biometry, and some practical experience in ecological research. This subject should help students develop their abilities to apply scientific principles to conservation problems, highlighting the strengths and weaknesses of particular approaches, and enhance their skills in data interpretation. Students should also learn how to access information from the primary scientific literature, through both electronic and traditional sources. The tutorial component of this subject should allow students to develop skills in speaking to a scientific audience with a small group of students. This will include accessing information from the primary literature, arrangement of content among speakers, and presentation of material (using appropriate media) by taking part in formal debate of a controversial topic in conservation biology.

**Assessment:** Two written assignments totalling up to 5000 words due during the semester (90%); a 10-minute oral presentation at the end of semester (10%).

### 654-309 Field Biology of Australian Wildlife

**Note:** Formerly 654-309 Field Biology of Australian Marsupials and Monotremes.

Experiments involving the use of animals are an essential part of this subject; exemption is not possible.

**Availability:** This subject is likely to be quota-restricted this year, see *Quota subjects* (p.9).

**Credit points:** 12.5

**Coordinator:** Dr K Handasyde; Dr G Coulson

**Prerequisites:** 654-202 and 654-204.

**Contact:** Four lectures, one tutorial and 60 hours practical work including a week-long field trip during the mid-semester break (*Semester 2*).

**Description:** This subject provides a field course on the ecology of Australian vertebrates: marsupials, monotremes, eutherians, birds, reptiles and amphibians. Students will develop skills in detection and survey of wildlife populations, as well as techniques for monitoring (such as radio telemetry). Students will also be given hands-on training in the capture, handling and identification of wildlife, together with collection of standard morphometric data, assessment of reproductive status, and analysis of behaviour, habitat and diet. A major emphasis will be the application of these methods to research into the ecology and management of wildlife populations.

This subject builds upon existing generic skills, including an ability to approach and assimilate new knowledge from observation and the literature, and an ability to use that knowledge to evaluate and communicate results. Students should gain practical experience in conducting research on wild animal populations, and an ability to integrate their findings with existing literature and knowledge. The practical and ethical constraints of working on wild animals under field conditions will be emphasised. Students will also develop skills in analysing, interpreting and evaluating data, and gain experience in writing scientific reports.

**Assessment:** Field reports totalling up to 3000 words due during the semester (60%); a 1-hour written examination on practical knowledge in the examination period (40%).

### 654-312 Marine Ecology

**Credit points:** 12.5

**Coordinator:** Prof M Keough; Dr R W Day

**Prerequisites:** 654-204.

**Contact:** 30 lectures plus six workshops/tutorials/multimedia presentations (*Semester 2*).

**Description:** The subject covers current ecological principles and concepts, particularly as they apply to the marine biota. The subject focuses on population dynamics and community ecology of marine organisms, covering biophysical interactions, early life history patterns, recruitment processes, interaction between species, and the role of natural disturbance in marine communities. The use of ecological principles for managing exploited marine organisms is also covered. An important emphasis of the course is developing the ability to read and assimilate current papers in the ecological literature.

This subject builds upon existing generic skills, including an ability to observe critically and to use the results of your observations to pose and answer theoretical questions and to solve practical problems. Students should develop their abilities to pose testable hypotheses, to devise appropriate sampling procedures and experimental designs, and to interpret and evaluate critically the evidence obtained from current contemporary studies. Students should also learn how to access information from the primary scientific literature, through both electronic and traditional sources, and gain experience in writing a scientific essay.

**Assessment:** Written essays or project work totalling up to 3000 words due during semester (50%); a 3-hour written examination in the examination period (50%).

### 654-313 Ecology in Changing Environments

**Note:** Formerly known as 654-313 Advanced Ecology.

**Credit points:** 12.5

**Coordinator:** Dr S Swearer; Dr M Kearney

**Prerequisites:** 654-204 or 606-204; plus one of 654-201 or 654-202.

**Contact:** 24 lectures (two per week) and 20 hours tutorials and practicals (*Semester 1*).

**Description:** This subject provides students with an essential grounding for careers in ecology, wildlife biology and conservation. It describes and evaluates advanced ecological concepts. Topics include spatial ecology and metapopulations, non-linear population dynamics and time-series analysis, life history evolution, ecological genetics, and indirect foodweb effects. An underlying theme is the relevance of evolutionary theory for understanding the distributions of species, their interactions, and their life history characteristics. An important focus of this subject is learning to read, understand, and critically evaluate relevant contemporary literature. The subject builds upon existing generic skills, including an ability to assimilate and critically evaluate new knowledge within a scientific paradigm, and to communicate that knowledge to a broad audience. Students will become practised at accessing scientific literature, through both electronic and traditional sources, and gain experience in scientific writing.

**Assessment:** Written essay and short-answer assignment work totalling up to 3000 words due during the semester (40%); a 1-hour written examination held mid-semester (20%); a 2-hour written examination in the examination period (40%).

### 654-315 Animal Behaviour

**Note:** Previously carried subject code 654-305.

Credit cannot be granted for both this subject and either 654-303 or 654-305 prior to 2003.

**Credit points:** 12.5

**Coordinator:** Dr R Mulder; Prof M A Elgar

**Prerequisites:** 654-201 or 654-202 or 654-204.

**Contact:** 30 lectures and 12 hours (one per week) multimedia presentations (*Semester 1*).

**Description:** This subject describes and evaluates contemporary issues in animal behaviour. In particular, it highlights the relevance of evolutionary theory to ultimate explanations of animal behaviour and other life-history characteristics. Topics include foraging behaviour, competitive interactions and the application of game theory, signals and communication, courtship and mating, sexual selection and sexual conflict, parental care, and the evolution of social behaviour.

The subject provides an opportunity to assimilate and critically evaluate the relevant, contemporary literature, thereby ensuring a familiarity with, and understanding of, current and controversial areas of animal behaviour.

The subject builds upon existing generic skills, including an ability to assimilate and critically evaluate new knowledge within a scientific paradigm, and to communicate that knowledge to a broad audience.

**Assessment:** A written essay of up to 2000 words due during the semester (40%); a 2-hour written examination in the examination period (60%).

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**516-302 Developmental Biology**

See full subject details on page 2.

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**606-309 Frontiers of Cell Biology**

See full subject details on page 3.

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**600-311 Research Project A**

See full subject details on page 1.

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**600-312 Research Project B**

See full subject details on page 1.

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**600-301 Problem Solving in Environmental Science**

See full subject details on page 1.

