

# 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.

Students can add further breadth to their degree by taking a co-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 (Honours)

For information about the faculty and department entry requirements for honours, please refer to *Bachelor of Science (Honours) and Bachelor of Information Systems (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.

**Credit points:** 12.5

**HECS-band:** 2

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

**Prerequisites:** Biology 600-141 and 600-142; or 600-131 and 600-132.

**Contact:** Twenty-four 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; and
- an understanding of current views about the phylogenetic relationships between the groups.

In the practical component students should develop the ability to recognise and classify the main groups of invertebrate organisms and an understanding of their morphological, physiological and behavioural characteristics.

The subject provides an introduction to the characteristics of the major invertebrate groups. Structural, physiological, behavioural and evolutionary aspects of their biology are covered. The practical component will cover the taxonomy and morphology of the major invertebrate groups.

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:** A 2-hour end-of-semester written examination and a 2-hour end-of-semester practical examination (60% exams); essay work, progress tests and excursion reports of up to 1000 words in total. Practical notebooks may be assessed (40% other).

#### 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.

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Dr D Young

**Prerequisites:** Biology 600-141 and 600-142; or 600-131 and 600-132

**Contact:** Twenty-four 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 liter-

ature and material and to develop the ability to critically evaluate questions and issues in that scientific field.

**Assessment:** A 2-hour end-of-semester written examination and a 2-hour end-of-semester practical examination (70% exams); laboratory notebooks and excursion reports of up to 1200 words in total (30%).

### 654-203 Animal Physiology

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

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Prof G Campbell

**Prerequisites:** Biology 600-141 and 600-142; or 600-131 and 600-132. Plus 25 points of 100-level chemistry.

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

**Description:** The subject deals with basic physiological processes in animals, and the physiological adaptations of animals to diverse and changing environments. Emphasis will be placed on the comparison of examples drawn from across the animal kingdom. At the completion of the practical component, students should understand the design of experiments, and have developed by first-hand experience an insight into the collection of data like those dealt with in lectures.

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 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. In the practical component, students should acquire skills in dissection and the use of laboratory equipment, develop first hand experience in design and execution of experiments, and learn how to interpret data and write this up as a scientific report.

**Assessment:** A 2-hour end of semester written examination (70%); up to 15 pages of practical assignments (30%).

### 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

**HECS-band:** 2

**Coordinator:** Dr G Coulson; Prof A Baker; Dr B Downes

**Prerequisites:** Biology 600-141 and 600-142; or 600-131 and 600-132; or geography 121-012 and 121-013.

**Contact:** Twenty-four lectures (two a week) and 27 hours practical work plus an 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:** A 2-hour end-of-semester written examination; up to 15 pages of practical and excursion reports; continuous assessment of practical exercises and laboratory problems.

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

### 654-207 Australian Wildlife Biology

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Dr K Handasyde

**Prerequisites:** Biology 600-111 or approval of coordinator.

**Contact:** Thirty-six 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:** A 2-hour, end-of-semester written examination (70%); reports on practical work and excursions of up to 1200 words in total (30%).

### 606-204 Ecology: Communities and Ecosystems

See full subject details on page 1.

### 606-205 Cell Biology

See full subject details on page 2.

## 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.

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Dr M J 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 primary scientific literature, through both electronic and traditional sources, and gain experience in writing scientific reports and essays.

**Assessment:** Up to 5000 words of essay work and/or reports on practical work and excursions (100%).

### 654-304 Reproduction

**Note:**

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

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Dr G Shaw; Prof M B Renfree

**Prerequisites:** Recommended: 25 points of 200-level physiology, anatomy, cell biology or biomedical science core (please seek advice from a subject coordinator).

**Corequisites:** 654-314

**Contact:** Five one-hour tutorials and 55 hours practical work (*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 structure and function of male and female reproductive systems;
- understand neuroendocrine and endocrine control systems and their role in the regulation of reproductive processes;
- understand and be able to apply selected methods used in reproductive physiology, including surgery; and
- understand the modern experimental approaches of reproductive physiology and assisted reproductive techniques.

Topics will include structure, function, and development of the reproductive organs; endocrine and neuroendocrine control of reproduction, fertilisation, pregnancy and lactation in mammals; 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 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 a report that is succinct, clear and completed on time. They should enhance their skills in data interpretation, and be alert to alternative explanations. Students should also improve their skills in dissection and gain first-hand surgical experience.

**Assessment:** An end-of-semester written examination of up to two hours (25%); participation in laboratory work and in problem-based learning tutorials; three practical reports or reviews of up to eight pages each (75%).

**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.

**Credit points:** 12.5

**HECS-band:** 2

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

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

**Corequisites:** 654-315

**Contact:** Two tutorials 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 presentations 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 approach and assimilate new knowledge, and to use that knowledge to evaluate and communicate written and other materials. Students should also develop skills in managing a group research project, analysing, interpreting and evaluating data, evaluating scientific evidence critically, and gain experience in writing a scientific report and making an oral presentation.

**Assessment:** An end-of-semester oral presentation, and up to 2000 words of practical assignments (100%).

### 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.

**Credit points:** 12.5

**HECS-band:** 2

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

**Prerequisites:** 654-201 or equivalent

**Contact:** Twelve lectures (two per day) and 40 hours of practical work; six hours 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:** Essay work and/or reports of up to 3000 words will be assessed (60% or 80%). A record of practical work undertaken that includes details of observations and experiments and oral presentations is also assessed (remaining 40% or 20%). The relative weighting that maximises the final mark will be used.

### 654-307 Evolution and the Human Condition

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Assoc Prof M A Elgar

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

**Contact:** Twenty-four 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 evolutionary theory of primate social and sexual behaviour and its relevance for humans; life-history theory and the evolution of senescence; frequency-dependent selection and the evolution of pathogen virulence and immune responses; and the application of evolutionary theory to understanding medical, veterinary, primary production and environmental systems.

The subject builds upon existing generic skills, including an ability to approach and assimilate new knowledge, and to use that knowledge to evaluate and communicate written and other materials. Students should also develop skills in evaluating scientific evidence critically, and gain experience in writing semi-popular scientific reports.

**Assessment:** A 2-hour end-of-semester written examination (65%); up to 2000 words of essay work and/or excursion report will be included in the assessment (35%).

### 654-308 Conservation Biology

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Dr G Coulson

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

**Contact:** Twenty-four 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:** Up to three written assignments (totalling not more than 6000 words) (100%).

### 654-309 Field Biology of Marsupials & Monotremes

**Note:**

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

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Dr S J Ward; Prof M B Renfree

**Prerequisites:** 654-204 and 654-203.

**Corequisites:** 654-319

**Contact:** Four lectures 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 to give an overall perspective on the biology of marsupials and monotremes. Students should learn to identify the major marsupial and monotreme families, and some of the techniques for studying these animals in captivity and in the wild. This subject also covers the basic taxonomic features of modern marsupials and monotremes, the separate radiations of marsupials in Australia and South America, and the relationships between the three groups of extant mammals.

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 observation, trapping and handling of wild animals and an ability to integrate their observations with existing literature and knowledge. Students should also develop skills in analysing, interpreting and evaluating data, and gain experience in writing a scientific report.

**Assessment:** A 1-hour end-of-semester written examination (40%). Up to 3000 words of practical and excursion/field reports (60%).

### 654-312 Marine Ecology

**Credit points:** 12.5

**HECS-band:** 2

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

**Prerequisites:** 654-204.

**Contact:** Thirty-six lectures (3 each week) (*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 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:** A 3-hour end-of-semester written examination (50%); up to 3000 words of essay work and/or reports (50%).

### 654-314 Lectures in Reproduction

**Note:** Students may not gain credit for 654-314 and 654-304 Reproduction prior to 2003.

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Dr G Shaw; Prof M B Renfree

**Prerequisites:** 654-203 or equivalent.

**Contact:** Thirty lectures, six 1-hour tutorials/videos/workshops (*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 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, mating, 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 learn how to access information from the primary scientific literature, through both electronic and traditional sources, and gain experience in writing scientific reports and essays. They should develop their abilities to evaluate scientific evidence critically, to enhance their skills in data interpretation, and be alert to alternative explanations.

**Assessment:** A 2-hour end-of-semester written examination (75%), a review of up to 3000 words and participation in problem-based learning tutorials (25%).

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

### 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

**HECS-band:** 2

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

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

**Contact:** Thirty-six lectures (three per week), 12 hours (one per week) multimedia presentations (*Semester 1*).

**Description:** This subject describes and evaluates contemporary issues in evolutionary and behavioural biology. In particular, it highlights the relevance of evolutionary theory to ultimate explanations of animal behaviour and other life-history characteristics. Topics include natural and sexual selection; the evolution of sex and sex allocation; the underlying neural mechanisms of animal behaviour (including motor, sensory and central nervous systems); foraging, competitive, mating and parental behaviour; learning; communication; and comparative social behaviour. The subject provides an opportunity to assimilate and critically evaluate the relevant, contemporary literature, thereby ensuring a familiarity and understanding of current and controversial areas of behavioural and evolutionary biology.

The subject builds upon existing generic skills, including an ability to approach and assimilate new knowledge, and to use that knowledge to evaluate and communicate written and other materials. Students should also develop skills in evaluating scientific evidence critically, and gain experience in writing a semi-popular scientific report.

**Assessment:** A 3-hour end-of-semester examination (60%), and up to 2000 words of essay work (40%)

### 654-319 Biology of Marsupials and Monotremes

**Note:** Credit cannot be granted for both this subject and 654-309 prior to 2003.

**Credit points:** 12.5

**HECS-band:** 2

**Coordinator:** Dr S J Ward, Prof M B Renfree

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

**Contact:** Thirty-six lectures (three per week) (*Semester 2*).

**Description:** This subject covers a wide range of biological disciplines, and shows how they are interconnected in the marsupials and monotremes. By the completion of the course, students should have developed an appreciation of the physiology, reproduction, behaviour, ecology and genetics of these mammals and understand how these characteristics have developed in the evolutionary and biogeographical histories of Australia and South America. This subject also covers the basic taxonomic features of modern marsupials and monotremes, the separate radiations of marsupials in Australia and South America, and the relationships between the three groups of extant mammals. The reproductive and developmental biology of marsupials and monotremes separates them markedly from each other and from eutherian mammals, and this subject puts particular emphasis on their study. We also show how studies of marsupials provide unique opportunities for understanding mammalian biology generally.

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 learn how to access information from the primary scientific literature, through both electronic and traditional sources. They should gain experience in evaluating scientific papers and writing a scientific review that is completed on time and meets the appropriate scientific standards.

**Assessment:** A 2-hour end-of-semester written examination (75%). Up to 3000 words of assignment (25%).

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### **516-302 Developmental Biology**

See full subject details on page 2.

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### **606-309 Cell Biology III**

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 2.

