

History and Philosophy of Science

Teaching in the history and philosophy of science (HPS) began at the University of Melbourne in 1946. The program has developed since then to become the leading HPS department in Australia. HPS offers students a learning environment that bridges the gap between the two cultures of science and the humanities. Students have the opportunity to explore historical, philosophical and sociological perspectives on science and technology. This unique mix of literacies helps prepare students for a wide range of professional careers.

Teaching in HPS is closely linked to current research, which ranges from the risks of gene technology and the social impact of new communication technologies, to the nature of scientific reasoning and a variety of historical projects.

The high profile enjoyed by the department, both nationally and internationally, attracts staff, students and visiting scholars of the highest calibre, to create a rich and vibrant culture of learning and research.

Time commitment to study

As well as scheduled contact hours for lectures, tutorial and seminars a considerable additional time commitment is needed to complete the academic requirements of each subject.

A subject-specific time commitment to study will be provided by your lecturer or tutor at the beginning of semester to help you schedule your workload and successfully manage your time during the semester. In addition, general estimates of the total time commitment required to study a 12.5-point single semester subject in the Faculty of Arts can be found on page 1.

Prerequisites

There are no prerequisites for first-year HPS subjects.

For science students there are no prerequisites for second-year HPS subjects beyond admission to second year.

For other students the prerequisite for a second/third-year HPS subject is usually 75 points of first-year study in any discipline area.

The prerequisite for a third-year subject in HPS is usually two second/third-year subjects in HPS.

Diploma in Arts (History and Philosophy of Science)

The Diploma in Arts (History and Philosophy of Science) is only available to students who are currently enrolled in a degree course at the University of Melbourne. It consists of a three-year sequence of study, and adds one year to the duration of your degree.

Students must complete 25 points of first-year subjects and 75 points of second/third-year subjects in history and philosophy of science. Alternatively, students who have completed appropriate background studies at first year may complete 100 points of second/third-year subjects in history and philosophy of science.

Requirements for a major

History and philosophy of science major

The requirements for a major in science are set out in *Planning a science major* (p.11). An arts major in HPS usually consists of nine 12.5-point subjects, totalling 112.5 points. It comprises:

- two first-year subjects in HPS (25 points); and
- seven second/third-year subjects in HPS (totalling 87.5 points), which must include at least one subject in each of the following areas:

- history of science
- philosophy of science
- sociology of science

Subjects for the major

	Sem.
First-year subjects	
136-101 History of Astronomy (p.2)	1
136-103 The Good Life, Science, and Nature (p.2)	1
136-105 Science, Philosophy and History (p.2)	2
136-175 The Ecological History of Humankind (p.2)	2
Second/third-year subjects	
136-029 Darwinism (p.3)	1
136-033 Science, Reason and Reality (p.3)	1
136-034 Science, Life and Mind (p.3)	1
136-035 A History of Nature (p.3)	Summer

Subjects for the major

	Sem.
136-037 Biotechnology in Modern Society (p.3)	1
136-038 The Scientific Revolution (p.4)	2
136-039 Blood, Guts and Science (p.4)	2
136-040 Science Technology and Society (p.4)	N/A
136-044 Current Issues in Philosophy of Science (p.4)	2
136-076 Social Theory and Political Analysis (p.2)	N/A
136-077 Psychoanalysis and Social Theory (p.2)	1
136-205 Cybersociety (p.4)	1
136-207 Philosophy of Biology (p.5)	N/A
136-208 History and Philosophy of Mathematics (p.5)	1
136-209 Intimacy and Technology (p.5)	2
136-210 Minds and Madness (p.5)	2
136-211 Asian Civilisations and Science (p.5)	1
136-213 Environmental History of Australia (p.5)	1
136-260 God and the Natural Sciences (p.6)	2
Third-year subjects for science students	
136-305 Cybersociety (Science 3) (p.6)	1
136-307 Philosophy of Biology (Science 3) (p.6)	N/A
136-308 History and Philosophy of Maths (Sci.3) (p.6)	1
136-310 Minds&Madness (Science 3) (p.6)	2
136-313 Environmental History of Australia (Sc3) (p.7)	1
136-329 Darwinism (Science 3) (p.7)	1
136-333 Science, Reason and Reality (Science 3) (p.7)	1
136-334 Science, Life and Mind (Science 3) (p.7)	1
136-335 A History of Nature (Science 3) (p.7)	Summer
136-337 Biotechnology in Modern Society (Sci.3) (p.8)	1
136-338 The Scientific Revolution (Science 3) (p.8)	2
136-340 Science Technology & Society (Science 3) (p.8)	N/A
136-344 Current Issues in Phil of Science (Sci3) (p.8)	2
136-360 God and the Natural Sciences (Science 3) (p.8)	2

Third/fourth-year subjects

136-442 Directed Study (p.9)	1 rep 2
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BA students may take up to three philosophy subjects towards their major in HPS. Subjects from the list below will be approved automatically. Other subjects may be approved by the Head of Department if the content is deemed appropriate.

- 161-009 Knowledge, Truth and Relativism (p.4)
- 161-033 Philosophical Problems of Space and Time (p.7)
- 161-104 Critical Thinking: The Art of Reasoning (p.3)
- 161-115 Introduction to Formal Logic (p.4)
- 161-210 Philosophy of Logic (p.7)
- 161-212 Non-Classical Logic (p.7)

Logic and philosophy of science major

A major in logic and philosophy of science combines subjects taught by the Department of Philosophy and the Department of History and Philosophy of Science. Logic and philosophy of science is an area of study which addresses questions about the structure of inference, the nature of knowledge, and the methodology and metaphysics of science. Students who undertake a major in logic and philosophy of science are able to pursue a course of study which draws together subjects in logic and the philosophy of science, and related areas.

A major in logic and philosophy of science consists of nine 12.5-point subjects, totalling 112.5 points, see *Logic and philosophy of science major* (p.1).

BA students who complete a major in logic and philosophy of science at a satisfactory level (minimum of H2A average within the major) may undertake combined honours in philosophy and HPS. They may not however be eligible for admission to pure honours in either department. Students wishing to undertake pure honours in either department should consult with the relevant honours coordinator for advice on how to design their course to meet departmental entry requirements for pure honours. For full details of the list of subjects which may be taken as part of this major, see page 1.

Honours entry

The requirements for science honours are set out in *Bachelor of Science (Degree with Honours) and Bachelor of Information Systems (Degree with Honours)* (p.1). The prerequisites for entry to the Bachelor of Arts (Honours) in HPS are:

- completion of all the requirements for the BA; and
- completion of a major in HPS, which must include at least one subject from each of the following areas:

- history of science
- philosophy of science

- sociology of science
- and a minimum average grade of H2B or higher over the second/third-year subjects within the major.

Honours requirements

Pure honours

Students undertaking pure honours in HPS must complete:

- 136-520 HPS Thesis (p.9) (50 points); and
- four honours subjects in HPS (totalling 50 points); and
- participation in a research methodology unit.

Honours subjects

Third/fourth-year subjects

	Sem.
136-442 Directed Study (p.9)	1 rep 2
Fourth-year and postgraduate subjects	
136-416 Beyond Realism and Relativism (p.9)	N/A
136-505 Philosophical Problems in Statistics (p.9)	N/A
136-506 Science and Discovery in the Pacific (p.9)	1
136-517 Science in the Classical World (p.9)	1
136-527 Ecology and Environmentalism (p.10)	1
136-528 Disease and Culture (p.10)	2
136-531 Genetics in Society (p.10)	1
136-535 Special Lecture Program (p.10)	N/A
136-536 Realism, Relativism and Naturalism (p.10)	N/A
136-540 Science, Conflict and Globalisation (p.10)	N/A
136-541 The Risk Society: Remaking Everyday Life (p.10)	2
136-543 The Ethics of Science (p.11)	N/A
136-544 Beyond the Spin: Technoscientific Failure (p.11)	N/A
136-566 Scepticism, Fallibilism and Relativism (p.11)	2

Honours and postgraduate diploma students may take up to two existing honours subjects offered by the Department of Philosophy towards their fourth-year studies in HPS. Subjects from the following list will be approved automatically. Other subjects may be approved on a case-by-case basis.

- 161-434 Epistemology and Metaphysics (p.10)
- 161-436 Issues in Analytic Metaphysics (p.10)
- 161-440 Philosophical Psychology (p.11)
- 161-445 Current Issues in Philosophy (p.11)
- 161-447 Topics in Advanced Logic (p.11)

No more than three philosophy and/or philosophy of science subjects may be taken as part of HPS honours. That is, pure honours in HPS must include at least one subject in an area other than the philosophy of science (or philosophy).

For information on how to apply see *Applying for Honours* (p.12).

Combined honours

Students intending to undertake combined honours in HPS and another area of study should consult the HPS honours coordinator about structuring their course.

Further study

A BA with honours in HPS can lead to an MA by advanced seminars and shorter thesis or by research thesis alone, or to a PhD. Students interested in postgraduate study should collect a copy of the separate postgraduate brochure and contact the departmental office to make an appointment to see the postgraduate coordinator.

For more information

History and Philosophy of Science
Ground Floor, Old Arts Building
The University of Melbourne
Victoria 3010
Tel: +61 3 8344 6556
Email: hps-info@unimelb.edu.au
Web: <http://www.hps.unimelb.edu.au>

First-year subjects

136-101 History of Astronomy

Note: Formerly available as 136-028. Students who have completed 136-028 are not eligible to enrol in this subject.

Availability: 1st year

Credit points: 12.5

Coordinator: Dr Keith Hutchison

Contact: Two 1-hour lectures and a 1-hour tutorial per week (*Semester 1*).

Description: This subject examines a dramatic change in European conceptions of the universe that took place during the 16th and 17th centuries. In the Middle Ages, humanity saw itself as occupying a unique Earth, the focus of God's attention, immobile at the centre of a finite universe. In the 16th century, the astronomer Copernicus proposed that the Sun was at the centre of the universe while the Earth orbited the Sun as one of the planets. A few astronomers took his idea seriously, and eventually managed to convert the educated world to the Copernican theory. With the idea that the Earth was just another planet came the idea that the Sun was just another star, and also the modern conception of space as effectively infinite, plus the possibility that life existed elsewhere. What made people change their view of the universe so drastically? How good was the evidence produced by Copernicus' followers? Were there other reasons, perhaps religious or political, for accepting or opposing the new cosmology? Why did people care so greatly whether the Earth moved? These are the sorts of questions which are central to the subject.

Assessment: A 2000 word essay 25% (due late in the semester); two 1-hour written class tests 12.5% each (one around mid-semester, one very late in the semester), and a 3-hour written examination 50% (during the examination period). Students can earn exemption from the examination, on the basis of the tests and essays. Students exempt from the exam, will be given a mark in which the essay is weighted at 50% and the tests at 25% each.

Prescribed texts: A subject reader will be available.

T Kuhn, *The Copernican Revolution*.

136-103 The Good Life, Science, and Nature

Note: Formerly available as 136-030. Students who have completed 136-030 are not eligible to enrol in this subject. Students cannot enrol in this subject if they completed 136-226/326 prior to 1996 or 136-103 prior to 1999.

Availability: 1st year

Credit points: 12.5

Coordinator: Assoc Prof Helen Verran

Contact: Two 1-hour lectures and a 1-hour tutorial per week (*Semester 1*).

Description: This subject asks, how should we analyse the relationship between nature, science, and society? Current theoretical approaches to the study of science in society will be discussed. The relations between nature, science and colonising, and the development of museums may be examined as case studies. On completion of the subject students should be familiar with current theoretical approaches to analysing science in society and be able to use these theoretical approaches to examine the relationship between values, science, and nature.

Assessment: Written work totalling 4000 words comprising a 1000 word essay 25% (due in week 6), a 1000 word class test 25% (due in week 10) and a 2000 word research report 50% (due at the end of SWOT VAC). A hurdle requirement of a minimum 70% attendance required.

Prescribed texts: A subject reader will be available.

136-105 Science, Philosophy and History

Note: Formerly available as 136-031. Students who have completed 136-031 are not eligible to enrol in this subject.

Availability: 1st year

Credit points: 12.5

Coordinator: Dr Neil Thomason

Contact: Up to 36 hours of tutorials and lectures (*Semester 2*).

Description: In this subject students will deal with such vital philosophical issues as, Can science prove a theory is true? What, if anything, is wrong with pseudo-science? Students will also tackle historical and political issues such as, Is it ever reasonable to not believe what scientists say? What should science's role in society be? The readings are from the history, sociology and philosophy of science. Students completing this subject should better understand that science is a remarkably complex and often beautiful result of an intricate set of forces: conceptual and experimental but also economic, social and individual factors.

Assessment: Written work totalling 4000 words comprising tutorial assignments of 2000 words 50% (due throughout the semester) and a 2000 word final paper 50%.

Prescribed texts: A subject reader will be available.

Chalmers, *What is This Thing Called Science?*, (3rd ed).

136-175 The Ecological History of Humankind

Note: Formerly available as 136-032. Students who have completed 136-032 are not eligible to enrol in this subject.

Availability: 1st year

Credit points: 12.5

Coordinator: Prof Janet McCalman

Contact: Two 1-hour lectures and a 1-hour tutorial per week (*Semester 2*).

Description: This subject is a study of the ecological history of humankind from prehistoric times to the present day, focussing on the interplay between disease ecology, food supplies, population and human culture. It is the history of human beings in competition with their environment, with each other, and with other organisms - an examination of the ways in which we have shaped the diseases which have afflicted us and the way in which health and disease have shaped our ways of life and our beliefs. The story begins with the health of hunter-gatherers and surveys world history from the rise of agricultural production and the domestication of animals, to conclude with HIV AIDS in the first and third worlds. It includes the Mongol hordes and the Black Death, biological imperialism and the conquest of the New World, slavery and disease, sex and the family, the challenge of the industrial city and the social determinants of health. Students who complete this course should acquire a map of the ecological history of the human past, and understand the historical roots of the health and wealth inequalities of the modern world.

Assessment: Two 1500 word research classpapers 30% each (due during the semester), a 1000 word class test 30% (due in week 12) and class participation 10%. A hurdle requirement of 80% attendance of tutorials required.

Prescribed texts: A subject reader will be available.

W H McNeill, *Plagues and Peoples*, Anchor (paperback). • J Diamond, *Guns, Germs and Steel, The Fates of Human Societies*, Viking (paperback).

Second/third-year subjects

136-029 Darwinism

Note: Formerly available as 136-102. Students who have completed 136-102 Darwinism are not eligible to enrol in this subject. For science third year, see 136-329 Darwinism (Science 3) (p.7).

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Dr John Waller

Prerequisites: Usually 75 points of first year study across any discipline areas.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 1*).

Description: This subject explores the origins and the implications of Charles Darwin's revolutionary theory of evolution by means of natural selection. It begins by examining the diverse sources from which the theory was constructed during the late 1830s: the geological data used to challenge Biblical stories of Creation and the Great Flood; the observations of plants and animals that began to suggest common descent; the evolutionary theories that preceded Darwin's own; and the fraught socio-economic context that arguably helped inspire Darwin's vision of a natural world steeped in struggle. The course goes on to examine the reasons why Darwin delayed publishing for more than twenty years and the reception of his theory following the appearance of *The Origin of Species* in 1859. The course then charts how Darwin's basic theory was refined by successive generations of biologists. It also examines the application of evolutionary theory to questions of politics, warfare, colonialism, economics, as well as race, class and gender, during the late nineteenth and twentieth centuries. The course concludes with a discussion of Darwin's legacy both in terms of the relationship between science and religion, and the emergence of evolutionary approaches to understanding human mind and behaviour.

Assessment: Tutorial assignment of 1500 words 35% (due mid-semester) and a 2500 word essay 65% (due at the end of semester).

Prescribed texts: P J Bowler, *Evolution: the history of an idea.*, (3rd ed) University of California Press July 2003.

136-033 Science, Reason and Reality

Note: Formerly available as 136-202/302. Students who have completed 136-202 or 136-302 Science, Reason and Reality are not eligible to enrol in this subject. For science third year, see 136-333 Science, Reason and Reality (Science 3) (p.7).

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Assoc Prof Howard Sankey

Prerequisites: Usually 75 points of first year study across any discipline areas.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 1*).

Description: This subject addresses some of the central issues in the philosophy of science. It will raise questions such as: What is the difference between science and non-science? Is there a universal scientific method? Or do the methods employed by scientists vary historically? Is scientific theory change a rational process? Is science objective? Do scientific theories inform us of the truth about the world? Students who take this class will have knowledge

of the major themes of recent and contemporary philosophical thinking about science. They will also have experience of the methods of critical analysis and argument employed in the philosophy of science and a background on which to base further study in the area.

Assessment: Written work totalling 4000 words comprising a 1500 word essay 30% (due mid-semester) and a 2500 word essay 70% (due at the end of semester).

Prescribed texts: A Chalmers, *What is This Thing Called Science?*. • M Curd & J A Cover, *Philosophy of Science: The Central Issues*. • I Hacking, *Representing and Intervening*.

136-034 Science, Life and Mind

Note: Formerly available as 136-203/303. Students who have gained credit for 136-203/303 Science, Life and Mind are not eligible to enrol in this subject. For science third year, see 136-334 Science, Life and Mind (Science 3) (p.7).

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Dr Neil Thomason

Prerequisites: Usually 75 points of first-year study across any discipline areas.

Contact: Between 10 and 12 weekly tutorials and between 20 and 24 lectures, normally two per week (*Semester 1*).

Description: Science depends on people being able to rationally investigate reality. Recent advances in cognitive psychology and evolutionary theory enable us to better understand how human rationality is possible and thus how science is possible. This subject deals with such historical and philosophical questions as, How do scientists determine the standard for good reasoning? What are those standards? How accurate are their judgements? On successful completion of this subject students should be familiar with the major philosophical theories of rationality; with the psychological, sociological and biological evidence regarding human rationality and irrationality; and have developed a better understanding of the relationships between the philosophical, biological, and psychological positions.

Assessment: Written work totalling 4000 words comprising of a 2000 word paper 50% (due mid-semester) and a paper of 2000 words 50% (at the end of semester).

136-035 A History of Nature

Note: Formerly available as 136-215/315. Students who have completed 136-215/315 Historical Encounters in a Changing Environment are not eligible to enrol in this subject. For science third year, see 136-335 A History of Nature (Science 3) (p.7). Strict enrolment deadlines apply to subjects taught during the Summer Semester. Any enrolment in, or withdrawal from, this subject for the Summer Semester must be made in line with HECS census dates.

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Assoc Prof Don Garden

Prerequisites: Usually 75 points of first year study across any discipline area.

Contact: This is an intensive course. Twenty four hours of lectures and twelve hours of tutorials during 14 - 28 January, 2005 (*Summer semester*).

Description: This subject traces some of the historical changes in scientific and environmental thought that occurred over the last 500 years, as Europeans spread out from the continent during the voyages of discovery, and discovered new frontiers that challenged their scientific and social beliefs. We will especially follow the changes in the environmental sciences that accompanied these voyages as notions of geography, natural history, evolutionary biology, geology and ecology were transformed. We will also examine some recent examples of new understandings of 'nature'. Case studies will include America, Australia, and other parts of the colonial world including the Pacific islands. Environmental issues ranging from introduced species, sustainability, resource management, pollution, overpopulation, environmental engineering and environmental philosophies will also be examined. This subject should be of interest to students who would like to learn more about the origins of the environmental sciences and our on-going attempts to live within a changing environment.

Assessment: A documentary exercise of 1000 words 20% (due at the end of semester), a research essay of 3000 words 70% (due a month after the end of semester), class participation and contribution 10%.

Prescribed texts: A reading pack will be available.

136-037 Biotechnology in Modern Society

Note: Formerly available as 136-222/322. Students who have completed 136-222/322 or 136-037 Issues in the Modern Life Sciences are not eligible to enrol in this subject. For science third year, see 136-337 Biotechnology in Modern Society (Sci.3) (p.8).

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Dr Rosemary Robins

Prerequisites: Usually 75 points of first year study across any discipline areas.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 1*).

Description: This subject will introduce students to selected research and commercial applications of modern biotechnology in order to discuss the broader issues that arise from them. A range of topics will be covered in this subject, which may include the recombinant DNA debate, biotechnology in agriculture, genetically modified food, pharmaceutical production, cloning, the human genome project, genetic testing and gene therapy. Students will consider some of the social, ethical, risk, and regulatory issues that arise from these applications of modern biotechnology and will examine some of the debates about these issues that have taken place in the wider community.

Assessment: Written work totalling 4000 words comprising a tutorial assignment of 1000 words 30% (due during the semester), a research essay of 2000 words 50% (due at the end of semester) and two class tests of 1000 words 20% (due mid-semester and at the end of semester).

Prescribed texts: A subject reader will be available.

136-038 The Scientific Revolution

Note: Formerly available as 136-224/324. Students who have completed 136-224/324 The Scientific Revolution are not eligible to enrol in this subject. For science third year, see 136-338 The Scientific Revolution (Science 3) (*p.8*).

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Dr Keith Hutchison

Prerequisites: Usually 75 points of first year study across any discipline areas.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 2*).

Description: This subject surveys a constellation of important changes in the thinking of educated people in 17th century Europe: a group of changes commonly referred to as 'The Scientific Revolution'. Students will examine the official philosophy of the Middle Ages, scholasticism and its notion that material objects were innately active; the appeal of alternative 17th century views of the matter as utterly passive; Descartes' mechanical philosophy; the Newtonian retreat from extreme mechanism; the impact of sceptical attacks on the reliability of human reason; and the acceptance of a science that was self-confessedly tentative and hypothetical. Throughout the subject, the complexity of the processes governing the acceptance of a philosophy of nature is emphasised and discussion is placed into its broader contexts with religious and political connections repeatedly perused. Students who successfully complete this subject will be capable of displaying an improved understanding of the above issues.

Assessment: A 2000 word essay 25% (due just after mid-semester), two 1-hour written class tests 12.5% each (one mid-semester, one late in the semester), and a 3-hour written examination 50% (during the examination period). Students can earn exemption from the examination, on the basis of the tests and essays. Students exempt from the exam will be given a mark in which the essay is weighted at 50% and the tests at 25% each.

136-039 Blood, Guts and Science

Note: Formerly available as 136-225/325. Students who have completed 136-225/325 Social History of Medicine (or 136-039 Medicine and Society) are not eligible to enrol in this subject.

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Prof Janet McCalman

Prerequisites: Usually 75 points of first year study across any discipline areas.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 2*).

Description: This subject is a history of medicine from prehistory to the present, with a special emphasis on the past three hundred years. It explores the experience and understanding of disease and its therapies in different cultural settings, and the transformation in those understandings since the scientific revolution - from the magical to the molecular. It includes ancient medicine, the evolution of the hospital, the contest between lay and professional practitioners, dissection and the birth of the clinic, the discovery of the germ and the rise of the laboratory. What is the patient's story? How has medicine changed our experience and management of sickness, trauma, sexuality and difference? What do we mean by 'medicalisation' and how has it changed private life? Students who complete this subject should develop the ability to analyse the role of medicine and its practitioners in the shaping of private experience, public welfare, suffering and mortality.

Assessment: A 1000 word tutorial diary 30% (due at the end of semester), a 3000 word research essay 60% (due at the end of semester) and class participation 10%. A hurdle requirement of 80% attendance of tutorials required.

Prescribed texts: A subject reader will be available.

R Porter, *Blood and Guts: a short history of medicine*, New York, London 2002.

136-040 Science Technology and Society

Note: Formerly available as 136-226/326. Students who have completed 136-226 or 136-226 Science, Technology and Society are not eligible to enrol in this subject.

Availability: 2nd and 3rd year

Credit points: 12.5

Prerequisites: Usually 75 points of first year study across any discipline areas.

Semester: Not Offered

Description: This subject examines the theoretical/conceptual frameworks within which science, technology and society can be analysed as mutually constitutive. Students will proceed through a series of case studies: how can we understand the process of building Gothic cathedrals?; examining the constitution of nature in TV wildlife documentaries; considering how Robert Boyle's airpump intervened in Restoration England; asking how zoos and science museums give us stories to live by. The case studies will be developed using video materials and site visits. Students who complete this subject should develop an understanding of, and ability to think critically about, the ways technologies and scientific knowledge claims are influenced by social, cultural and historical contexts.

136-044 Current Issues in Philosophy of Science

Note: Formerly available as 136-238/338. Students who have completed 136-238 or 136-338 Current Issues in the History and Philosophy of Science are not eligible to enrol in this subject. For science third year, see 136-344 Current Issues in Phil of Science (Sci3) (*p.8*).

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Assoc Prof Howard Sankey

Prerequisites: Usually 75 points of first year study across any discipline areas.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 2*).

Description: This subject deals with current research in the philosophy of science. Its subject matter can range from philosophical critiques of evolutionary theory to medical history to the role of science in debates about the environment. In 2004, this subject will focus on the ideas of the natural, naturalism and naturalisation, as they occur in current philosophical thinking about science. Among the topics dealt with will be the question of whether animals have minds and whether the human mind is a result of evolution.

Assessment: Written work totalling 4000 words comprising a 1500 word essay 30% (due mid-semester) and a 2500 word essay 70% (due at the end of semester).

136-076 Social Theory and Political Analysis

See full subject details on page 2.

136-077 Psychoanalysis and Social Theory

See full subject details on page 2.

136-205 Cybersociety

Note: Formerly available as 103-005. Students who have completed 103-005 are not eligible to enrol in this subject. Students who have completed 103-210/310 Cybersociety: Information Technology, Society and Self (or 103-005 Cybersociety) are not eligible to enrol in this subject. For science third year, see 136-305 Cybersociety (Science 3)

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Dr Michael Arnold

Prerequisites: Usually 75 points of first year study across any discipline area.

Contact: A 1-hour lecture and a 1.5-hour tutorial/practical session per week (*Semester 1*).

Description: In this subject students will engage in a study of high-technology and information systems in a social and cultural context, and will examine critical issues which lie at the intersection of the social and the technical. Topics covered include cybernetics, cyberspace, cyborgs and other 'cybers', virtual lives and virtual communities, the information economy, privacy and surveillance, digital convergence, multimedia and hypermedia, and technoutopian and dystopian visions. Students will participate in theoretical work

and 'hands-on' experience. Students who successfully complete this subject should be able to critically analyse and evaluate controversial issues relating to information systems in the social context, argue credible positions in relation to these controversies, and be able to identify and draw upon the major theoretical and methodological discourses through which the relationship between information systems and society might be understood.

Assessment: An essay of 2000 words 50% (due at the end of semester), an essay of 1000 words 25% (due in week 4), a seminar presentation of 800 words 20% (due throughout the semester) and contribution to an on-line discussion 5% (due throughout the semester).

Prescribed texts: A subject reader will be available.

W Gibson, *Neuromancer*, Grafton Books 1986. • N Stephenson, *Snow Crash*, Penguin 1993.

136-207 Philosophy of Biology

Availability: 2nd and 3rd year

Credit points: 12.5

Prerequisites: Usually 75 points of first year study across any discipline area.

Semester: Not Offered

Description: Evolutionary theory has changed our thinking about the world. This class examines philosophical issues raised by the core concepts of evolutionary theory, including such concepts as teleological explanation, fitness, function, natural selection, units of selection and species. Questions to be addressed include: What is fitness? Is survival of the fittest a tautology? What is the unit of selection: the gene? the organism? the group? The class also considers what contribution evolutionary theory makes to our understanding of human and animal minds, human behavior, and ethics. Topics to be addressed here include modularity and the mental, sociobiology, and the interconnections between fact and value. On completion of the subject students should have a sophisticated understanding of theoretical issues in evolutionary biology; develop skills in critical and theoretical thinking; and be able to assess claims about the social significance of contemporary research in the biological sciences.

136-208 History and Philosophy of Mathematics

Note: This subject may be cancelled if there are insufficient enrolments. For Science third year, see 136-308 History and Philosophy of Maths (Sci 3).

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Dr Thomason and Prof Priest

Prerequisites: Usually 75 points of first-year study including at least 25 points of Philosophy and/or HPS and/or Math (statistics).

Contact: Twenty four 60-minute lectures and twelve 60 minute tutorials (*Semester 1*).

Description: Mathematics, in addition to being a source of important knowledge in its own right, is key to much of science. This class examines theories of what mathematical knowledge is, how it evolves, and how it can apply to the physical world. It examines such questions as: Why do the standards of mathematic rigour change?; What is mathematical truth?; Is mathematics reducible to logic?; Can Mathematics by itself tell us anything about the world?; Why is Mathematics often so crucial in the natural sciences?; Where did the notion of axiom come from and how has it evolved?; What are the implications of Godel's theorems?; How much of mathematics can be axiomatised?; How does mathematics progress? On completion of the subject students should have a sophisticated understanding of philosophical and historical issues relating to mathematics as well as further develop their skills in critical and theoretical thinking.

Assessment: Written work totalling 4000 words, consisting of 2000 words 50% in short weekly mini-papers and 2000 words 50% in a major final paper.

136-209 Intimacy and Technology

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Dr Michael Arnold

Prerequisites: Usually 75 points of first year study across any discipline area.

Contact: One 1-hour lecture and a 90-minute tutorial per week (*Semester 2*).

Description: Intimate Technologies are those that we use to understand ourselves, and that we use to establish and maintain our relations with others. The subject approaches technologies of intimacy through a wide variety of examples and case studies - technologies of modesty and privacy (underwear and bedrooms), technologies of surveillance (CAT scans and bar-codes), communications technologies (love letters and SMS), reproductive technologies (IVF and sheep-gut), technologies that mediate personal identity (the data-body and flesh-fashion), and that mediate social and community relations (swarms and networks). The unifying themes that run through these examples approach technologies of intimacy in terms of their propensity to abstract, attenuate, individuate and discipline our intimate relations, and stu-

dents are invited to critically assess this argument. In so doing, students will gain a fresh and critical understanding of the ways in which technologies and our lives are intertwined.

Assessment: A 2500 word essay 50% (due at the end of semester), a 1000 word essay 30% (due in week 4) and a 500 word seminar presentation 20% (due during the semester).

Prescribed texts: Intimate Technologies Reader.

136-210 Minds and Madness

Note: For Science third year, see 136-310 Minds & Madness (Sci 3).

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Dr John Waller

Prerequisites: Usually 75 points of first year study across any discipline area.

Contact: Between 10-12 weekly tutorials and 20-24 lectures, normally two per week (*Semester 2*).

Description: This course examines changing ideas of mind and mental malady from the ancients up to the present, focusing on the diverse ways in which mental phenomena have been defined, studied, treated and explained. Minds and Madness explores how the human mind, traditionally considered the seat of the soul, has been brought within the purview of science. We chart the way in which mind has been reduced to matter, mind has been conflated with brain, and theology has given way to biological science. This course also considers how the experience and the meaning of insanity have been shaped by religion, the rise of science and the decline of magical beliefs. Specific lectures focus on insanity and the witch-craze; madness; stigma and the wise fool; the rise of mental materialism; phrenology; IQ testing and the measurement of the mind; the psychiatric response to shell-shock; and several lectures may analyse the impact of new scientific paradigms upon our understanding of the mind: Cartesian physics during the Scientific Revolution, electrophysiology from the eighteenth century, Darwinism since the mid-1800s, and the considerable advances, in more recent times, in our understanding of neural circuitry and brain chemistry.

Assessment: Written work totalling 4000 words comprising a tutorial assignment of 1500 words 35% (due mid-semester) and an essay of 2500 words 65% (due at the end of semester).

Prescribed texts: R Porter, *Madness: A Brief History*, Oxford University Press 2003.

136-211 Asian Civilisations and Science

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Assoc Prof Helen Verran

Prerequisites: Usually 75 points of first year study in any discipline.

Contact: Twenty three 60-minute lectures and five 90-minute tutorial/workshops (*Semester 1*).

Description: This subject examines the development of science as a cultural phenomenon in Asian contexts. It is taught through contemporary and historical case studies. We examine ways sciences 'came to life' in particular places at particular times as modern Asian endeavours. Examining particular instances, students will better understand contemporary science as a global phenomenon. Studies will reveal some of the characteristics and properties of the scientific enterprise in contemporary and historical Asian contexts. Case studies might include contemporary debates around ecology in India, molecular biology in Japan, and the heated debate around quantum theory and the study of fundamental particles that erupted in post-Mao China.

Assessment: Four 500 word tutorial exercises 12.5% each (due at the end of tutorials at regular intervals during the semester) and a research report of 2000 words 50% (due at the end of SWOT VAC).

Prescribed texts: A subject reader will be available for purchase.

136-213 Environmental History of Australia

Note: Formerly available as 131-279/379/064. Students who have completed 131-279/379/064 are not eligible to enrol in this subject. For science third year, see 136-313 Environmental History of Australia (Sc3).

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Assoc Prof Don Garden

Prerequisites: Usually 75 points of first year study across any discipline areas.

Contact: A 2-hour lecture and a 1-hour tutorial per week (*Semester 1*).

Description: This subject will examine the forces which shaped the Australian environment before colonisation, and modern scientific debates over Aboriginal impacts on the environment. Taking as a central theme the role of science and technology, it will examine British/European attitudes towards lands they 'discovered', and the consequent treatment of the Australian land

mass, flora and fauna. Students should complete the subject with a knowledge of such issues as the contribution of agricultural science to development in Australia; the impact on the environment of European means of production; the technology of urban development and the environmental impact of urban growth; responses to the landscape as reflected in the arts, and the desire to transform the landscape to conform to European perceptions; the scientific and cultural debates over optimum population size; and the evolution of conservation and environmental consciousness and action in Australia. There will be a special study of Melbourne water - potable, waste and streams.

Assessment: A fieldwork short essay of 500 words 10% and a documentary exercise of 500 words 10% (due mid-semester), a research essay of 3000 words 70% (due at the end of semester), class participation and contribution 10%.

Prescribed texts: A subject reader will be available.

136-260 God and the Natural Sciences

Note: Available at second and third year, except in science (second year only). For science third year see 136-360 God and the Natural Sciences (Science 3). Students who have completed 136-360 God and the Natural Sciences (Science 3) are not eligible to enrol in this subject.

Availability: 2nd and 3rd year

Credit points: 12.5

Coordinator: Dr Neil Thomason

Prerequisites: Usually 75 points of first year study across any discipline area.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two lectures per week (*Semester 2*).

Description: This subject studies the complex relationship between religion, theology, and the natural sciences. Theological concerns guided the science of Kepler, Newton and many other early scientists. They held that studying the Universe demonstrated the attributes of God. After Darwin, this view was replaced by radically different ones: to some science and religion are necessarily antagonistic, to others they belong to different realms. We examine this change, the reasoning (good and bad) behind it and its residues, including some modern debates: 'Anthropic Principle', multiple universes, and such scientific/philosophical issues such as Why are the laws of nature what they are? Finally, we explore the relationship between the 'personal God' of religious experience and the 'philosophers' God' posited to explain facts about the natural world.

Assessment: Written work totalling 4000 words comprising a 750 word paper 19% (due week 5) and a paper of 1250 words 31% (due mid-semester) and a paper of 2000 words 50% (due during the examination period).

Prescribed texts: A subject reader will be available. Other books will be required.

Third-year subjects

136-305 Cybersociety (Science 3)

Note: Students who have completed 103-210/310 Cybersociety: Information Technology, Society and Self (or 103-005/136-205 Cybersociety) are not eligible to enrol in this subject. Only available at science third year; for other levels see 136-205 Cybersociety. This subject is based on 136-205 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Dr Michael Arnold

Prerequisites: Usually two second year HPS subjects.

Contact: A 1-hour lecture and a 1.5-hour tutorial/practical session per week (*Semester 1*).

Description: In this subject students will engage in a study of high-technology and information systems in a social and cultural context, and will examine critical issues which lie at the intersection of the social and the technical. Topics covered include cybernetics, cyberspace, cyborgs and other 'cybers', virtual lives and virtual communities, the information economy, privacy and surveillance, digital convergence, multimedia and hypermedia, and technoutopian and dystopian visions. Students will participate in theoretical work and 'hands-on' experience. Students who successfully complete this subject should be able to critically analyse and evaluate controversial issues relating to information systems in the social context, argue credible positions in relation to these controversies, and be able to identify and draw upon the major theoretical and methodological discourses through which the relationship between information systems and society might be understood.

Assessment: An essay of 2000 words on a chosen topic 35% (due at the end of semester), an essay of 2000 words relating your science major to a chosen topic 35% (due at the end of semester), an essay of 1000 words 15% (due in week 4), a seminar presentation of 800 words 10% (due throughout the semester) and contribution to an on-line discussion 5% (due throughout the semester).

Prescribed texts: A subject reader will be available.

W Gibson, *Neuromancer*, Grafton Books 1986. • N Stephenson, *Snow Crash*, Penguin 1993.

136-307 Philosophy of Biology (Science 3)

Note: This subject is only available to science students for credit at third year level. Students who have completed 136-207 Philosophy of Biology are not permitted to enrol in this subject. This subject is based on 136-207 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Prerequisites: Usually two second year HPS subjects.

Semester: Not Offered

Description: Evolutionary theory has changed our thinking about the world. This class examines philosophical issues raised by the core concepts of evolutionary theory, including such concepts as teleological explanation, fitness, function, natural selection, units of selection and species. Questions to be addressed include: What is fitness? Is survival of the fittest a tautology? What is the unit of selection: the gene? the organism? the group? The class also considers what contribution evolutionary theory makes to our understanding of human and animal minds, human behavior, and ethics. Topics to be addressed here include modularity and the mental, sociobiology, and the interconnections between fact and value. On completion of the subject students should have a sophisticated understanding of theoretical issues in evolutionary biology; develop skills in critical and theoretical thinking; and be able to assess claims about the social significance of contemporary research in the biological sciences.

136-308 History and Philosophy of Maths (Sci.3)

Note: This subject is only available to science students for credit at third-year level. Students who have completed 136-208 History and Philosophy of Mathematics are not permitted to enrol in this subject. This subject may be cancelled if there are insufficient enrolments. This subject is based on 136-208 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Dr Thomason and Prof Priest

Prerequisites: Usually two second year HPS subjects.

Contact: Twenty four 60-minute lectures and twelve 60 minute tutorials (*Semester 1*).

Description: Mathematics, in addition to being a source of important knowledge in its own right, is key to much of science. This class examines theories of what mathematical knowledge is, how it evolves, and how it can apply to the physical world. It examines such questions as: Why do the standards of mathematic rigour change?; What is mathematical truth?; Is mathematics reducible to logic?; Can Mathematics by itself tell us anything about the world?; Why is Mathematics often so crucial in the natural sciences?; Where did the notion of axiom come from and how has it evolved?; What are the implications of Godel's theorems?; How much of mathematics can be axiomatised?; How does mathematics progress? On completion of the subject students should have a sophisticated understanding of philosophical and historical issues relating to mathematics as well as further develop their skills in critical and theoretical thinking.

Assessment: Written work totalling 4000 words, consisting of 2000 words 50% in short weekly mini-papers and 2000 words 50% in a major final paper.

136-310 Minds&Madness (Science 3)

Note: Only available at Science third year, for other levels, see 136-210 Minds and Madness. Students who have completed 136-210 are not eligible to enrol in this subject. This subject is based on 136-210 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Dr John Waller

Prerequisites: Usually two second year HPS subjects.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 2*).

Description: This course examines changing ideas of mind and mental malady from the ancients up to the present, focusing on the diverse ways in which mental phenomena have been defined, studied, treated and explained. Minds and Madness explores how the human mind, traditionally considered the seat of the soul, has been brought within the purview of science. We chart the way in which mind has been reduced to matter, mind has been conflated with brain, and theology has given way to biological science. This course also considers how the experience and the meaning of insanity have been shaped by religion, the rise of science and the decline of magical beliefs. Specific lectures focus on insanity and the witch-craze; madness; stigma and the wise

fool; the rise of mental materialism; phrenology; IQ testing and the measurement of the mind; the psychiatric response to shell-shock; and several lectures may analyse the impact of new scientific paradigms upon our understanding of the mind: Cartesian physics during the Scientific Revolution, electrophysiology from the eighteenth century, Darwinism since the mid-1800s, and the considerable advances, in more recent times, in our understanding of neural circuitry and brain chemistry.

Assessment: Written work totalling 6000 words comprising a tutorial assignment of 1500 words 25% (due mid-semester), an essay of 3000 words 50% (due at the end of semester) and a 1500 word project on an advanced topic related to the subject but not covered in classroom teaching 25% (due at the end of semester).

Prescribed texts: R Porter, *Madness: A Brief History*, Oxford University Press 2003.

136-313 Environmental History of Australia (Sc3)

Note: Formerly available as 131-279/379/064. Students who have completed 131-279/379/064 are not eligible to enrol in this subject. Students cannot gain credit for both this subject and 136-213 Environmental History of Australia. Only available at science third year; for other levels see 136-213 Environmental History of Australia. This subject is based on 136-213 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Assoc Prof Don Garden

Prerequisites: Usually two second-year HPS subjects.

Contact: A 2-hour lecture and a 1-hour tutorial per week (*Semester 1*).

Description: This subject will examine the forces which shaped the Australian environment before colonisation and modern scientific debates over Aboriginal impacts on the environment. Taking as a central theme the role of science and technology, it will examine British/European attitudes towards lands they 'discovered', and the consequent treatment of the Australian land mass, flora and fauna. Students should complete the subject with a knowledge of such issues as the contribution of agricultural science to development in Australia; the impact on the environment of European means of production; the technology of urban development and the environmental impact of urban growth; responses to the landscape as reflected in the arts, and the desire to transform the landscape to conform to European perceptions; the scientific and cultural debates over optimum population size; and the evolution of conservation and environmental consciousness and action in Australia. There will be a special study of Melbourne water - potable, waste and streams.

Assessment: Written work totalling 6000 words comprising a documentary exercise of 500 words 10% (due mid-semester), a research essay of 3000 words 55% (due at the end of swot vac) and a 2500 word project on an advanced topic 25% (due one week later), class participation and contribution 10%.

Prescribed texts: A subject reader will be available.

136-329 Darwinism (Science 3)

Note: Formerly available as 136-102/029. Students who have completed 136-102 or 136-029 are not eligible to enrol in this subject. Students cannot gain credit for both this subject and 136-102 before 1999 or 136-029 after 1998. Only available at science third year; for other levels, see 136-029 Darwinism (*p.3*). This subject is based on 136-029 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Dr John Waller

Prerequisites: Usually two second-year HPS subjects.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 1*).

Description: This subject explores the origins and the implications of Charles Darwin's revolutionary theory of evolution by means of natural selection. It begins by examining the diverse sources from which the theory was constructed during the late 1830s: the geological data used to challenge Biblical stories of Creation and the Great Flood; the observations of plants and animals that began to suggest common descent; the evolutionary theories that preceded Darwin's; and the fraught socio-economic context that arguably helped inspire Darwin's vision of a natural world steeped in struggle. The course goes on to examine the reasons why Darwin delayed publishing for more than twenty years and the reception of his theory following the appearance of *The Origin of Species* in 1859. The course then charts how Darwin's basic theory was refined by successive generations of biologists. It also examines the application of evolutionary theory to questions of politics, warfare, colonialism, economics, as well as race, class and gender, during the late 19th and 20th centuries. The course concludes with a discussion of Darwin's legacy both in terms of the relationship between science and religion, and the emergence of evolutionary approaches to understanding human mind and behaviour.

Assessment: A tutorial assignment of 1500 words 25% (due mid-semester), a long essay of 3000 words 50% and a 1500-word project on an advanced topic related to the subject but not covered in classroom teaching 25% (both due at the end of semester).

Prescribed texts: PJ Bowler, *Evolution: the history of an idea*, (3rd ed), University of California Press, July 2003.

136-333 Science, Reason and Reality (Science 3)

Note: Formerly taught as 136-202/302/317. Students who have completed 136-202/302/317 are not eligible to enrol in this subject. Students cannot gain credit for both this subject and 136-033. Only available at science third year; for other levels see 136-033 Science, Reason and Reality (*p.3*). This subject is based on 136-033 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Assoc Prof Howard Sankey

Prerequisites: Usually two second-year HPS subjects.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 1*).

Description: This subject addresses some of the central issues in the philosophy of science. It will raise questions. What is the difference between science and non-science? Is there a universal scientific method or do the methods employed by scientists vary historically? Is scientific theory change a rational process? Is science objective? Do scientific theories inform us of the truth about the world? Students who take this class will have knowledge of the major themes of recent and contemporary philosophical thinking about science. They will also have experience of the methods of critical analysis and argument employed in the philosophy of science and a background on which to base further study in the area.

Assessment: Written work totalling 6000 words comprising an essay of 1500 words 25% (due mid-semester), an essay of 2000 words 35% (due at the end of semester) and an essay of 2500 words 40% (due at the end of the examination period).

Prescribed texts: A Chalmers, *What is this thing called science?*. • M Curd & J A Cover, *Philosophy of science: the central issues*. • I Hacking, *Representing and intervening*.

136-334 Science, Life and Mind (Science 3)

Note: Formerly taught as 136-203/303/308. Students who have completed 136-203/303/308 are not eligible to enrol in this subject. Students cannot gain credit for both this subject and 136-203/303 before 1999 or 136-034 after 1998. Only available at science third year; for other levels see 136-034 Science, Life and Mind (*p.3*). This subject is based on 136-034 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Dr Neil Thomason

Prerequisites: Usually two second-year HPS subjects.

Contact: Between 10 and 12 weekly tutorials and between 20 and 24 lectures, normally two per week (*Semester 1*).

Description: Science depends on people being able to rationally investigate reality. Recent advances in cognitive psychology and evolutionary theory enable us to better understand how human rationality is possible and thus how science is possible. This subject deals with such historical and philosophical questions as: How do scientists determine the standard for good reasoning? What are those standards? How accurate are their judgements? On successful completion of this subject, students should be familiar with the major philosophical theories of rationality; with the psychological, sociological and biological evidence regarding human rationality and irrationality; and have developed a better understanding of the relationships between the philosophical, biological, and psychological positions

Assessment: Written work totalling 6000 words, consisting of one 2000 word paper 33% (due mid-semester), and two final papers of 2000 words each 33% (one due at the end of swot vac, the other due one week later).

136-335 A History of Nature (Science 3)

Note: Students cannot gain credit for both this subject and 136-215/315 before 1999 or 136-035 after 1998. Only available at science third year; for all other levels see 136-035 A History of Nature (*p.3*). This subject is based on 136-035 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Assoc Prof Don Garden

Prerequisites: Usually two second-year HPS subjects.

Contact: This is an intensive course. Twenty-four hours of lectures and twelve hours of tutorials during 14-28 January, 2005 (*Summer semester*).

Description: This subject traces some of the historical changes in scientific and environmental thought that occurred over the last 500 years, as Europeans spread out from the continent during the voyages of discovery, and discovered new frontiers that challenged their scientific and social beliefs. We will especially follow the changes in the environmental sciences that accompanied these voyages as notions of geography, natural history, evolutionary biology, geology and ecology were transformed. We will also examine some recent examples of new understandings of 'nature'. Case studies will include America, Australia, and other parts of the colonial world including the Pacific islands. Environmental issues ranging from introduced species, sustainability, resource management, pollution, overpopulation, environmental engineering and environmental philosophies will also be examined. This subject should be of interest to students who would like to learn more about the origins of the environmental sciences and our ongoing attempts to live within a changing environment.

Assessment: Written work totalling 6000 words for third-year Science students comprising a documentary exercise of 1000 words 20% (due at the end of semester), a research essay of 3000 words 50% (due a month after the end of semester), a 2000-word project on an advanced topic 20% (due five weeks after the end of semester), class participation and contribution 10%.

Prescribed texts: A reading pack will be available.

136-337 Biotechnology in Modern Society (Sci.3)

Note: Formerly available as 136-332. Students who have completed 136-332 (Biology in Modern Society or Biotechnology in Modern Society) are not eligible to enrol in this subject. Students cannot gain credit for both this subject and 136-222/322 before 1999 or 136-037 after 1998. Only available at science third year; for other levels, see 136-037 Biotechnology in Modern Society (p.3). This subject is intended for students who are majoring in biological science. This subject is based on 136-037 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Dr Rosemary Robins

Prerequisites: Usually two second-year HPS subjects. Alternatively, Biology 141 and 142 and two second-year zoology, botany, genetics, microbiology or biochemistry subjects.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 1*).

Description: This subject will introduce students to selected research and commercial applications of modern biotechnology in order to discuss the broader issues that arise from them. A range of topics will be covered in this subject, which may include the recombinant DNA debate, biotechnology in agriculture, genetically modified food, pharmaceutical production, cloning, the human genome project, genetic testing and gene therapy. Students will consider some of the social, ethical, risk and regulatory issues that arise from these applications of modern biotechnology, and will examine some of the debates about these issues that have taken place in the wider community.

Assessment: Written work totalling 6000 words comprising a tutorial assignment of 1000 words 30% (due during semester), a research essay of 2000 words 30% (due at the end of semester), an advanced topic of 2000 words 20% (due during semester) and two class tests 1000 words 20% (due mid-semester and at the end of semester respectively).

Prescribed texts: A subject reader will be available.

136-338 The Scientific Revolution (Science 3)

Note: Only available at science third year. For other levels, see 136-038 The Scientific Revolution (p.4). Students cannot gain credit for both this subject and 136-224/324 before 1998 or 136-038 after 1998. This subject is based on 136-038 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Dr Keith Hutchison

Prerequisites: Usually two second-year HPS subjects.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 2*).

Description: This unit surveys a constellation of important changes in the thinking of educated people in 17th century Europe: a group of changes commonly referred to as 'The Scientific Revolution'. Students examine the official philosophy of the middle ages, scholasticism, and its notion that material objects were innately active; the appeal of alternative 17th century views of the matter as utterly passive; Descartes' mechanical philosophy; the Newtonian retreat from extreme mechanism; the impact of sceptical attacks on the reliability of human reason; the acceptance of a science that was self-confessedly tentative and hypothetical. Throughout the unit, the complexity of the processes governing the acceptance of a philosophy of nature is emphasised; and our discussion is placed into its broader contexts with religious and political connections repeatedly perused. Students who successfully complete this

subject will be capable of displaying an improved understanding of the above issues.

Assessment: One 2000-word essay 30% (due just after mid-semester), two 1-hour written class tests 10% each (one mid-semester, one late in the semester), and a 3-hour written examination 50% (during the examination period).

136-340 Science Technology & Society (Science 3)

Note: Only available at science third year; for all other levels see 136-040 Science Technology and Society (p.4). Students cannot gain credit for this subject and 136-226/326 before 1999 or 136/040 after 1999. This subject is based on 136-040 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Prerequisites: Usually two second-year HPS subjects.

Semester: Not Offered

Description: This subject examines the theoretical/conceptual frameworks within which science, technology and society can be analysed as mutually constitutive. Students proceed through a series of case studies: How can we understand the process of building Gothic cathedrals? examining the constitution of nature in TV wildlife documentaries; considering how Robert Boyle's airpump intervened in Restoration England; asking how zoos and science museums give us stories to live by. The case studies will be developed using video materials and site visits. Students who complete this subject should develop an understanding of, and an ability to think critically about, the ways technologies and scientific knowledge claims are influenced by social, cultural and historical contexts.

136-344 Current Issues in Phil of Science (Sci3)

Note: Formerly available as 136-318. Students who have completed 136-318 are not eligible to enrol in this subject. Students cannot gain credit for both this subject and 136-238/338 before 1999 or 136-044 after 1998. Only available at science third year; for other levels, see 136-044 Current Issues in Philosophy of Science (p.4). This subject is based on 136-044 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Assoc Prof Howard Sankey

Prerequisites: Usually two second-year HPS subjects.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two per week (*Semester 2*).

Description: This subject deals with current research in the history and/or philosophy of science. Its subject matter can range from philosophical critiques of evolutionary theory and medical history to the role of science in debates about the environment. In 2003 this subject will focus on the ideas of the natural, naturalism and naturalisation, as they occur in current philosophical thinking about science. Among the topics dealt with will be the question of whether animals have minds and whether the human mind is a result of evolution.

Assessment: Written work totalling 6000 words comprising an essay of 1500 words 25% (due mid-semester), an essay of 2000 words 35% (due at the end of semester) and an essay of 2500 words 40% (due at the end of the examination period).

136-360 God and the Natural Sciences (Science 3)

Note: Only available at Science third year, for other levels, see 136-260, God and the Natural Sciences. Students who have completed 136-260 are not eligible to enrol in this subject. This subject is based on 136-260 but involves additional work.

Availability: 3rd year

Credit points: 12.5

Coordinator: Dr Neil Thomason

Prerequisites: Usually two second-year HPS subjects.

Contact: Between 10-12 weekly tutorials and between 20-24 lectures, normally two lectures per week (*Semester 2*).

Description: This subject studies the complex relationship between religion, theology, and the natural sciences. Theological concerns guided the science of Kepler, Newton and many other early scientists. They held that studying the Universe demonstrated the attributes of God. After Darwin, this view was replaced by radically different ones: to some science and religion are necessarily antagonistic, to others they belong to different realms. We examine this change, the reasoning (good and bad) behind it and its residues, including modern debates such as: 'Anthropic Principle', multiple universes, and scientific/philosophical issues such as: Why are the laws of nature what they are? Finally, we explore the relationship between the 'personal God' of religious experience and the 'philosophers' God' posited to explain facts about the natural world.

Assessment: Written work totalling 6000 words comprising a short paper of 750 words 13% (due week 5), a longer paper of 1250 words 21% (due mid-semester) and two final papers of 2000 words 33% each (due during the examination period).

Prescribed texts: A subject reader will be available. Other books will be required.

Third/fourth-year subjects

136-442 Directed Study

Note: Formerly available as 136-342 and 136-062. Students who have completed 136-342 or 136-062 are not eligible to enrol in this subject.

Availability: 3rd and 4th year

Credit points: 12.5

Coordinator: Assoc Prof Don Garden

Prerequisites: Completion of four history and philosophy of science subjects with an average of H2B. Admission into Directed Study is subject to severe restrictions. Students must apply in writing to the coursework coordinator at least one week prior to the semester in which they plan to enrol. Before doing so, they must obtain the written agreement of a member of Department who is prepared to supervise the research project.

Contact: By arrangement with the supervisor. Students should expect to devote at least 80 hours to this subject during the course of the semester (*Semester 1, repeat 2*).

Description: The content of this subject is dependent on the interests and expertise of the student. This subject functions to provide students with the opportunity to do supervised research on a topic not normally treated in the undergraduate curriculum. The student should gain skills in independent research and acquire the ability to apply historical, philosophical and social forms of analysis to a piece of scientific work of particular personal and intellectual interest.

Assessment: Written work totalling 5000 words 100% (due during the examination period).

Fourth-year subjects

136-520 HPS Thesis

Availability: 4th year

Credit points: 50

Coordinator: Dr Rosemary Robins

Contact: Regular supervision. Students will be expected to participate regularly in a methodology seminar intended to assist them in the development of the thesis (*Semester 1, repeat 2*).

Description: A supervised research project of 15 000 words.

Assessment: A thesis of 15 000 words 100% (due at the end of the second semester of enrolment).

136-496 HPS Research Project (Science)

Availability: 4th year

Credit points: 50

Coordinator: Dr Rosemary Robins

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours.

Contact: Regular meetings with the supervisor over two consecutive semesters of enrolment. Students will be expected to participate regularly in a methodology seminar intended to assist them in the development of the thesis (*Semester 1, repeat 2*).

Description: A supervised research project of 15 000 words in length.

Assessment: A thesis of 15 000 words 100% (due at the end of the second semester of enrolment).

136-497 HPS Advanced Coursework (Science)

Availability: 4th year

Credit points: 50

Coordinator: Dr Rosemary Robins

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours.

Semester: Semester 1, repeat 2

Description: This subject comprises four single-semester seminars taken over two consecutive semesters of enrolment and chosen from the HPS Department fourth-year and postgraduate-level subjects and approved by the supervisor. Where a fourth-year or postgraduate subject offered by a cognate department is particularly relevant to a student's thesis, permission may be granted for enrolment in that subject.

Assessment: Written work totalling 5000 words in each of the four seminars 100% (due at the end of each semester).

136-416 Beyond Realism and Relativism

Note: Formerly available as 136-416 and 136-064. Students who have completed 136-416 or 136-064 are not eligible to enrol in this subject. This subject may be cancelled unless enrolments reach five.

Availability: 4th year

Credit points: 12.5

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.

Semester: Not Offered

Description: This subject will introduce students to key themes in contemporary debate in the philosophy of science, such as those emerging from the opposition between scientific realism and epistemological realism.

136-505 Philosophical Problems in Statistics

Availability: 4th year and postgraduate

Credit points: 12.5

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.

Semester: Not Offered

Description: This subject will examine the claim that statistics used in the social sciences are often seriously flawed. It will examine the history of 20th century statistics, with an emphasis on the Fisher/Neyman-Pearson debates and the attempts over the last 30 years to reform social science statistics. It will examine the claim that faulty statistics severely impede the growth of the social sciences. Finally, it will examine the claim that many outstanding philosophical questions about science can be answered by a sophisticated application of Bayes' theorem.

136-506 Science and Discovery in the Pacific

Availability: 4th year and postgraduate

Credit points: 12.5

Coordinator: Assoc Prof Don Garden

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.

Contact: A 2-hour seminar per week (*Semester 1*).

Description: There are two interwoven streams in this subject: a study of the role of the Pacific as a scientific laboratory and issues in the environmental history of the Pacific. The Pacific or Oceania has been of central significance for many of the major scientific discoveries, theories and understandings which have shaped Western science. The subject will examine some of these, such as the scientists on the voyages of James Cook, and the work of such people as Charles Darwin, Alfred Russell Wallace, Patrick Vinton Kirch, Bahn and Flenley, and Athol Anderson. In parallel, the Pacific has provided a number of fundamental case studies in the evolution of human understandings of and interaction with the non-human environment. Such studies of human interactions with Pacific environments (the environmental history in a broad sense) provide invaluable insights into broader aspects of human settlement and exploitation. This is particularly accessible given that most initial human settlement has taken place within the last 1500 years and the European wave in the last 250 years. The scholarship about this is new and vibrant, and the subject will contain case studies drawn from such issues as the debates over Polynesian migration, contrasting early settlement interactions in Tikopia and Mangaia, Maoris in New Zealand, the impact of alien introductions in Hawaii and the environmental impact of the sandalwood trade.

Assessment: Written work totalling 5000 words.

136-517 Science in the Classical World

Note: Formerly available as 136-417 and 136-065. Students who have completed 136-417 or 136-065 are not eligible to enrol in this subject.

Credit points: 12.5

Coordinator: Dr Keith Hutchison

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.

Contact: A 2-hour seminar per week (*Semester 1*).

Description: In this subject selected issues, deemed central to the history of science and philosophy in the ancient Greek (and Roman) world, are studied at a moderately advanced level, via discussion of various primary and secondary texts. Though the exact content of the unit is to vary from year to year, typical topics might be the contrast between pre-Socratic philosophy and its predecessors; early notions of mathematical proof; Plato's hostility to empiricism; Aristotle's account of matter; and Euclid and the axiomatic method. Students who successfully complete this subject will be capable of displaying an improved understanding of the above issues.

Assessment: A written class test of 1000 words 20% (in the last week of semester) and a 4000-word essay developed from a 15 minute class presentation 80% (due at the beginning of the examination period). The presentation is a non-assessed hurdle requirement.

136-527 Ecology and Environmentalism

Note: Students who have completed 136-419 are not eligible to enrol in this subject.

Availability: 4th year and postgraduate

Credit points: 12.5

Coordinator: Assoc Prof Helen Verran

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.

Contact: A 2-hour seminar per week (*Semester 1*).

Description: This subject examines particular sites of environmental management to develop understanding of the unprecedented transformation of the environment, the sciences and political movements across the twentieth century. Students will study a particular environmental organisation becoming sensitised to the social, political and cultural elements these organisations embody. At the same time they will analyse the scientific practices of the environmental organisation. This subject will be of interest to students who wish to learn more about the historically and geographically complex relationships embedded in the ways we use the sciences to manage the environment.

Assessment: A research report of 5000 words 100% (due at the end of the swot vac).

Prescribed texts: A subject reader will be available.

136-528 Disease and Culture

Note: Formerly available as 136-451 and 136-069. Students who have completed 136-451 or 136-069 are not eligible to enrol in this subject. The subject may be cancelled unless enrolments reach five.

Availability: 4th year and postgraduate

Credit points: 12.5

Coordinator: Dr Ross Jones

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours or a postgraduate coursework program.

Contact: A 2-hour seminar per week (*Semester 2*).

Description: This subject is an overview of the historical study of disease and biomedicine with special reference to public health in comparative, cross-cultural settings. It builds on recent work in the history of biomedical sciences, the sociology of illness, cultural studies and social theory to re-frame the history of public health. Students should develop an understanding of the cultural framing of disease in western and non-western societies; demonstrate the ability to analyse critically a range of biomedical and public health interventions; and gain experience in carrying out a research project in the history of health care, biomedical sciences and public health.

Assessment: A 1500-word seminar diary 30% (due at the end of semester), a 500-word essay proposal and plan 10% (due mid-semester), a 3000-word research essay 50% (due at the end of semester) and class participation 10%. A hurdle requirement of 80% attendance of seminars required.

136-531 Genetics in Society

Note: Formerly available as 136-511, 136-640, 136-349 and 136-049. Students who have completed 136-511, 136-640, 136-349 or 136-049 are not eligible to enrol in this subject.

Availability: 4th year and postgraduate

Credit points: 12.5

Coordinator: Dr Rosemary Robins

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.

Contact: A 2-hour seminar per week (*Semester 1*).

Description: This subject will examine genetics in society. Theoretical approaches drawn from the sociology of science and technology will be discussed and case studies of the application of genetics in today's society will be examined. These may include the human genome project, genetic screening, gene therapy, and DNA profiling. Students undertaking this subject should acquire a greater understanding of the complex relationship between genetics and society, and explore ways of analysing how the new genetics shapes our understanding of human health, reproduction and the environment.

Assessment: A research essay of 5000 words 100% (due during the exam period).

136-535 Special Lecture Program

Note: Formerly available as 136-635, 136-509, 136-347 and 136-047. Students who have completed 136-635, 136-509, 136-347 or 136-047 are not eli-

gible to enrol in this subject. This subject may be cancelled unless enrolments reach five.

Availability: 4th year and postgraduate

Credit points: 12.5

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.

Semester: Not Offered

Description: Selected topics in the history and philosophy of science.

136-536 Realism, Relativism and Naturalism

Note: Formerly available as 136-510, 136-638, 136-348 and 136-048. Students who have completed 136-510, 136-638, 136-348 or 136-048 are not eligible to enrol in this subject.

Availability: 4th year and postgraduate

Credit points: 12.5

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours or a postgraduate coursework program.

Semester: Not Offered

Description: In this subject students will examine the current trend toward naturalistic approaches to methodological, epistemological and metaphysical issues in modern philosophy of science. Much recent philosophy of science has been characterised by an opposition between realist advocates of the objectivity of science and a variety of cognitive relativist positions which deny such objectivity. However, a separate, naturalistic tendency in the philosophy of science promises to transcend the opposition between realism and relativism. On completion of this subject, students should have a grasp of the history of and differences between realist and relativist approaches to the philosophy of science and should understand the implications of the naturalistic approach.

136-540 Science, Conflict and Globalisation

Availability: 4th year and postgraduate

Credit points: 12.5

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.

Semester: Not Offered

Description: This subject examines controversies in which science and technology are central to the management of uncertainty and to decisions about how we shall live. It focuses on the relationship between expertise, policy, and citizenship. It introduces students to several case studies, such as hazardous waste management, the siting of a nuclear facility, logging of native forests, uranium mining, the release of genetically modified organisms into the environment and the conservation and management of water resources. Students will examine how decisions are made when the science is intrinsically difficult and uncertain. They will evaluate methods of stakeholder engagement and resolution of conflict. They will trace and analyse the strategies and pathways by which outcomes are negotiated and consider the scope and effectiveness of citizen involvement in decision-making. On completion of the subject, students will have gained a greater appreciation of the complex relationships between science, policy and citizenship in areas of decision-making where science and technology are central.

136-541 The Risk Society: Remaking Everyday Life

Availability: 4th year and postgraduate

Credit points: 12.5

Coordinator: Dr Rosemary Robins

Prerequisites: Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.

Contact: A 2-hour seminar per week (*Semester 2*).

Description: This subject examines ways in which discourses and practices of science, technology and medicine have become central to the assessment and management of risk and the organisation of everyday life. The subject focuses on contemporary risk politics and its effects, particularly on our social and individual identities. It introduces students to the ways in which these discourses and practices have become politicised features of a 'risk society' that create dilemmas of trust, scepticism and anxiety. Students will examine arguments put forward by several leading social theorists about the nature, extent and effects of the 'risk society'. These will be illustrated by several case studies, which may include decision-making and the new genetics; food risks; gene technology in agriculture; environmental management, and subjectivity in cyberspace. On completion of the subject, students will have developed an understanding of the risk society debate and knowledge of several exemplary case studies.

Assessment: Four 500-word papers totalling 2000 words 40% (due throughout the semester) and an essay 3000 words 60% (due at the end of semester).

Prescribed texts: A subject reader will be available.

136-543 The Ethics of Science**Credit points:** 12.5**Prerequisites:** Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.**Semester:** Not Offered**Description:** This subject will study the ethics in science in both the laboratory, the applied field and in the politics and commercialisation of science and technology. It will explore the ethics of the conduct of scientific research and the application of scientific knowledge in society, through a series of case studies across the biomedical, environmental, biological and hard sciences. It will draw on moral philosophy and applied ethics, as well as the ethics of science in society, science and technology studies and the philosophy of science.

136-544 Beyond the Spin: Technoscientific Failure**Credit points:** 12.5**Prerequisites:** Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.**Semester:** Not Offered**Description:** There is much to be learned from failure, and the application of science and technology has in recent years provided no shortage of examples - the Ford Pinto, Bhopal, Challenger, thalidomide, cane toads, Chernobyl, the M16 rifle, Three-Mile Island, the Zeebrugge Ferry. Through a series of case studies, from the perspective of various stakeholders and the public, and from a variety of theoretical perspectives, students will appreciate the educative value of failure; will critically examine the dimensions of failure; the contested accounts of causes and explanations of failure; and will assess the political, institutional, and public-sphere responses to failure. Students who successfully complete this subject will be able to convincingly interpret and respond to cases of technoscientific failure through an understanding of: the contexts in which judgments of failure are made; the range of empirical factors and causes that may be implicated in failure; the theoretical grounds upon which causal claims are made and are contested; and critical assessments of common responses to technoscientific failure. Students will also conduct a case study of their own.

136-566 Scepticism, Fallibilism and Relativism**Note:** Formerly available as 136-449 and 136-068 and 136-466. Students who have completed 136-449 or 136-068 or 136-466 are not eligible to enrol in this subject.**Availability:** 4th year and postgraduate**Credit points:** 12.5**Coordinator:** Dr Neil Thomason**Prerequisites:** Usually admission to the postgraduate diploma or fourth-year honours, or a postgraduate coursework program.**Contact:** A 2-hour seminar per week (*Semester 2*).**Description:** This subject involves an examination of foundational issues in the epistemology of science. Students who complete this subject should have a critical understanding of some advanced topics in the theory of scientific knowledge and be familiar with the current literature on epistemological relativism or related issues in the philosophy of science.**Assessment:** Written work totalling 5000 words consisting of several weekly mini-papers totalling 1500 words, a one-hour class presentation of 1000 words and a 2500-word research paper (due at the end of semester).

