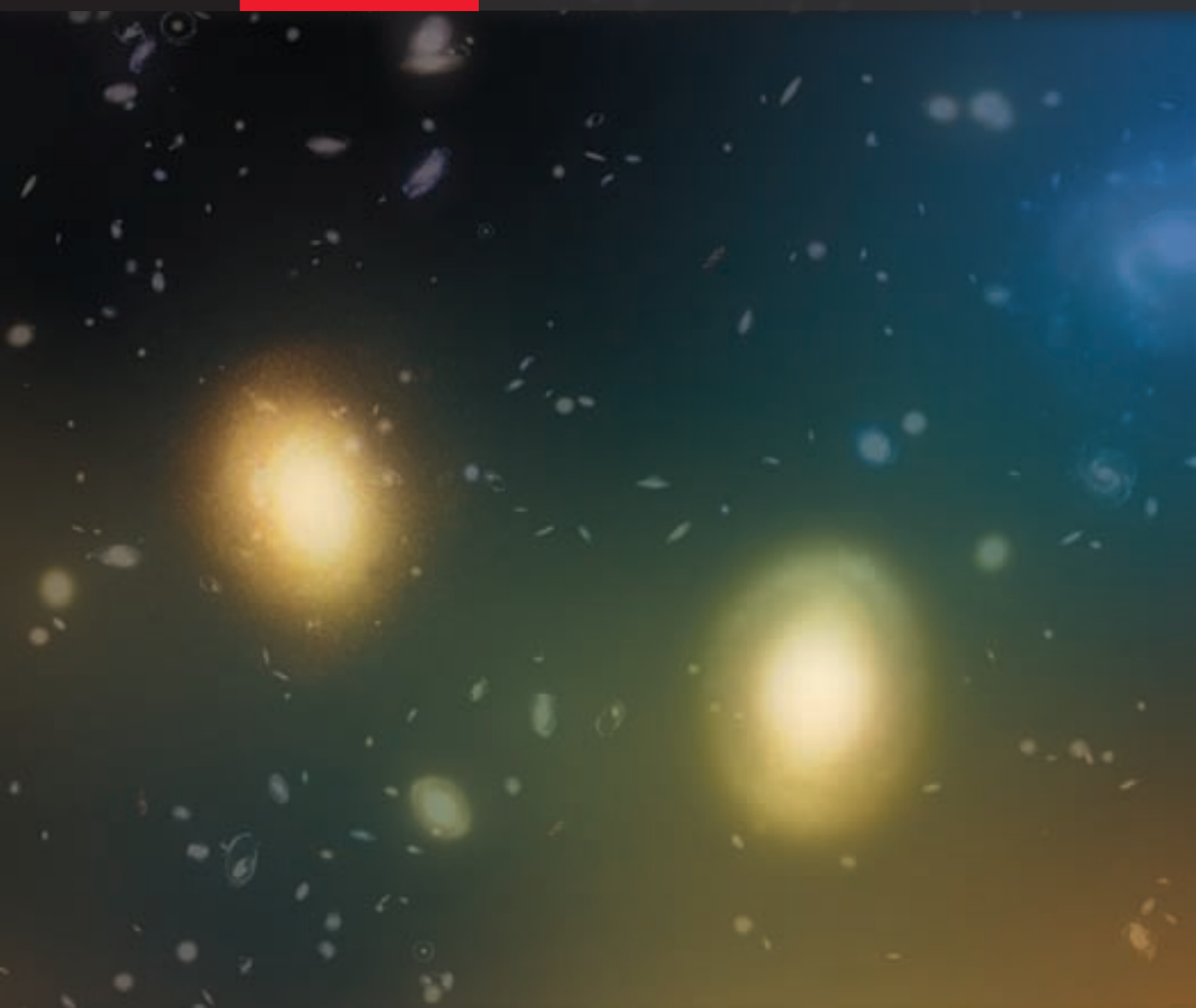
postgraduate

SWINBURNE UNIVERSITY OF TECHNOLOGY

Postgraduate courses in
Astronomy



Faculty of ICT | www.swinburne.edu.au/astronomy

Swinburne Astronomy Online combinines an exciting mix of astronomical simulations, websites, powerpoint presentations, newsgroup discussions and guest contributions on the latest astronomy headlines

The aim of the program is to provide graduates from any discipline with a basic understanding of astronomical concepts, plus an overview of issues and techniques in contemporary astronomy. The course is designed to meet the needs of members of the general public interested in finding out more about contemporary astronomy, as well as members of special interest groups such as amateur astronomers, science teachers, science communicators and people working in astronomy-related fields.

Astronomy

Graduate Certificate of Science (Astronomy)

Graduate Diploma of Science (Astronomy)

Master of Science (Astronomy)

Program overview

These programs cover the fundamental concepts and 'big questions' of modern astronomy, in order to equip students with a good overall understanding and general knowledge about modern astronomy, rather than training as a professional astronomer.

The graduate certificate is suitable for members of the general public who wish to obtain an overview of astronomy, with the option to continue to more advanced units and qualifications.

The intention of the graduate diploma and masters is to provide scope for more specialist study in astronomy, plus opportunities for major project work, while still maintaining an emphasis on learning about the fundamental concepts and 'big questions' of modern astronomy.

Location

Online delivery

Program length

Graduate Certificate

Six months full-time or equivalent part-time

Graduate Diploma

One year full-time or equivalent part-time

Master

One and a half years full-time or equivalent part-time

Admission requirements

All students are expected to have a working knowledge of the English language, to be computer literate and to have Internet access outside of Swinburne.

Graduate Certificate of Science (Astronomy)

Admission to this program is normally restricted to residents of Australia with a recognised tertiary qualification or substantial relevant experience. Applicants without a tertiary qualification may be admitted, but in order to progress into a higher level of the program at least a credit grade average (>65%) in the graduate certificate must be obtained.

Graduate Diploma of Science (Astronomy)

Admission to this program is normally restricted to applicants with a recognised tertiary qualification or substantial relevant experience. Applicants not holding a recognised tertiary qualification may be admitted to the graduate diploma after successfully obtaining at least a credit grade (>65%) in two individual units (enrolled in an individual unit basis), or having successfully completed the graduate certificate with at least a credit grade average (>65%).

Master of Science (Astronomy)

Admission to this program is normally restricted to applicants with a recognised tertiary qualification. Applicants not holding a recognised tertiary qualification may be admitted to the master after successfully completing the graduate certificate or graduate diploma. Full credit for units successfully completed on either an individual unit basis, the graduate certificate or the graduate diploma will be granted on transfer into the master.

Time commitment

Students will need to make assessable contributions to the course's online discussion groups as well as undertake assignments and project work. The equivalent student contact hours for each unit is five hours per week during academic semesters.

Assessment

Assessment does not include examinations. Rather, it consists of a balanced range of tasks, which typically may include essays, projects, computer managed tests and newsgroup contributions.

Program structure

The units in this program are delivered online, with course material available via CDROM and/or Internet links, and contact via newsgroup and email. All units are valued at 12.5 credit points unless otherwise stated.

In order to gain the graduate certificate students must complete four units of study to the value of 50 credit points.

In order to gain the graduate diploma students must complete eight units of study to the value of 100 credit points.

In order to gain the master students must complete 12 units of study to the value of 150 credit points.

Unit of study outlines

Exploring the Solar System

This is an introductory-level astronomy unit about our solar neighbourhood and the challenges of extraterrestrial exploration. No background knowledge of astronomy or physics is assumed and the emphasis is on conceptual astronomy, not mathematical techniques.

Exploring Stars and the Milky Way

This is an introductory-level astronomy unit about the birth, life and death of stars and the structure of our Galaxy. No background knowledge of astronomy or physics is assumed and the emphasis is on conceptual astronomy, not mathematical techniques.

Exploring Galaxies and the Cosmos

This unit introduces galaxies and galaxy clustering, theories of dark matter and galactic evolution. It assumes introductory, tertiary (post-secondary) level mathematics and physics, plus familiarity with the content of Exploring Stars and the Milky Way.

Prerequisite: Exploring Stars and the Milky Way or equivalent.

Theories of Space and Time

Introducing special and general relativity and cosmology, this unit assumes introductory, tertiary (post-secondary) level mathematics and physics, plus familiarity with the content of Exploring Galaxies and the Cosmos.

Prerequisite: Exploring Galaxies and the Cosmos or equivalent.

Tools of Modern Astronomy

This unit addresses basic concepts plus the latest developments in telescope, detector and space probe design for astronomy at all wavelengths. Introductory, tertiary (post-secondary) level mathematics and physics is assumed.

History of Astronomy

Students in this unit will look at the development and impact of astronomy from ancient times to the present day, from the viewpoint of practising astronomers. No background knowledge of astronomy or physics is assumed.

Introductory Radio Astronomy and SETI

Overviewing both single- and multiple-dish radio astronomy and their applications, this unit studies key issues and techniques in an area where radio astronomy plays a key part: the Search for Extra-Terrestrial Intelligence (SETI). This unit will assume introductory, tertiary (post-secondary) level mathematics and physics.

Astrophotography and CCD Imaging

This unit looks at the principles behind the imaging of astronomical objects with telescopes, conventional cameras and CCD cameras, plus the use of computer techniques for image processing. It focuses particularly on techniques and equipment within reach of the (existing or intending) serious amateur astronomer, and will assume introductory, tertiary (post-secondary) level mathematics and physics, plus familiarity with the content of Exploring Stars and the Milky Way.

Prerequisite: Exploring Stars and the Milky Way or equivalent.

Studies in Space Exploration

Commencing with an introductory section on the basic principles, issues and science goals of space exploration, this unit will trace the history and development of space exploration with particular reference to manned versus unmanned space exploration, spacecraft design, launch and navigation, imaging and remote sensing. Public perception of space science and analysis of the costs, risks and benefits of space exploration will be discussed, with special reference to ethical and legal implications of topics such as the use of radioisotope fuel sources, ‘space junk’ and mining rights in space. Familiarity with the content of Exploring the Solar System is assumed, plus introductory tertiary (post-secondary) level mathematics and physics (or equivalent).

Prerequisite: Exploring the Solar System or equivalent.

Stellar Astrophysics

Following on from Exploring Stars and the Milky Way, this unit introduces the physical processes underlying stellar properties and the principles behind models of stellar evolution. It will assume introductory, tertiary (post-secondary) level mathematics and physics, plus familiarity with the content of Exploring Stars and the Milky Way.

Prerequisite: Exploring Stars and the Milky Way or equivalent.

Major Project – History of Astronomy

This unit aims to develop the participants' detailed knowledge and understanding of a particular aspect or period of the history of astronomy, their literature and Internet research skills, plus synthesis and communication skills. It assumes familiarity with the content of History of Astronomy.

Prerequisite: History of Astronomy or equivalent.

Introduction to Particle Physics and High Energy Astrophysics

Providing a general introduction to particle physics and more specifically to modern high-energy astrophysics, this unit assumes familiarity with Theories of Space and Time, plus introductory tertiary (post-secondary) level mathematics and physics (or equivalent).

Prerequisite: Theories of Space and Time or equivalent.

Major Project – Observational Astronomy

This unit aims to develop the participants' detailed knowledge and understanding of the principles involved in a particular aspect or application of astrophotography and/or CCD imaging; and to provide practical experience in the techniques involved in observational astronomy. It assumes familiarity with the content of Astrophotography and CCD Imaging.

Prerequisite: Astrophotography and CCD Imaging or equivalent.

Great Debates in Astronomy

Students in this unit will investigate in depth great debates in astronomy which have shaped (or are still shaping) our current understanding of the universe and its evolution. It assumes familiarity with Exploring Galaxies and the Cosmos, plus introductory tertiary (post-secondary) level mathematics and physics (or equivalent).

Prerequisite: Exploring Galaxies and the Cosmos, and History of Astronomy or equivalent.

Major Project – Computational Astrophysics

This unit will teach students about specific astrophysical concepts with the aid of computer simulations, and will give students a grounding in computer modelling and an appreciation of the ability of science and computers to make complex phenomena understandable. Students will gain a deep understanding – via numerical experiments – of the physics governing systems such as the asteroid belt, the evolution of stars, the orbits of stars within the galaxy, and galactic dynamics.

Prerequisite: Exploring Galaxies and the Cosmos or equivalent.

Astrobiology and the Origins of Life

This unit provides an overview of the multidisciplinary nature of astrobiology – combining geology, chemistry, biology and astronomy. It will investigate the origins and evolution of life on Earth, the interaction between life and its environment, and the search for life elsewhere in the Solar System and beyond.

Prerequisite: Exploring the Solar System and Exploring Stars and the Milky Way or equivalent.

Key staff

Centre for Astrophysics and Supercomputing
Dr Sarah Maddison, Course Co-ordinator
Dr Glen Mackie, Assistant Course Co-ordinator
Dr Chris Fluke

External staff
Dr Chris Flynn, Tuorla Observatory, Finland
Dr Lisa Kewley, Institute for Astronomy, Hawaii
Dr Randii Wessen, NASA Jet Propulsion Laboratory

Astronomy

General information

Fees for local students

In 2007, tuition fees for this program are based on $990 per 12.5 credit point unit of study. In the event that a unit of study is derived from another program, the applicable fee will be that of the other program. All fees are reviewed each year and may increase without notice.

FEE-HELP is a government funded loan that helps eligible fee paying students pay their tuition fees. FEE-HELP is not available to New Zealand citizens and most holders of Australian permanent visas, however is available to Australian citizens and holders of a permanent humanitarian visa. For further information visit: www.swinburne.edu.au/postgrad

Application procedure

Students can apply online at
www.swinburne.edu.au/astronomy

International students

If you want to study astronomy at Swinburne but are not an Australian resident, telephone Swinburne Astronomy Online on (+61 3) 9214 5971 or email astro@swin.edu.au

In 2007, tuition fees for international students are based on $1,100 per 12.5 credit point unit of study. In the event that a unit of study is derived from another program, the applicable fee will be that of the other program. All fees are reviewed each year and may increase without notice.

Further information

Faculty of Information and Communication Technologies
Telephone: 1300 368 777
Email: astro@swin.edu.au
Website: www.swinburne.edu.au/astronomy

CourseFinder
For detailed course and unit information visit: www.swinburne.edu.au/coursefinder
or ring the Information Hotline 1300 368 777

Postgraduate Information Day
The Atrium, John Street, Hawthorn campus.
Tuesday 10 October 2006, 3.00pm–7.00pm

FAQ
If you have a question that needs answering, search our FAQ website.
Can't find an answer? Submit an enquiry for a prompt and convenient response.
Visit www.swinburne.edu.au/faq

eNews, Views and Profiles from Swinburne
visit: www.swinke.com

Swinburne's Virtual Campus Tour
visit: www.swinburne.edu.au/campustour

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Let's get on with it.