

## 290AA Postgraduate Diploma in Science

<b>Year and Campus:</b>	2011 - Parkville
<b>CRICOS Code:</b>	023188D
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Level:</b>	Graduate/Postgraduate
<b>Duration &amp; Credit Points:</b>	100 credit points taken over 12 months full time. This course is available as full or part time.
<b>Coordinator:</b>	Melbourne Graduate School of Science
<b>Contact:</b>	<p>Melbourne Graduate School of Science  Faculty of Science  The University of Melbourne  Victoria 3010</p> <p>Tel: + 61 3 8344 6128  Fax: +61 3 8344 3351</p> <p>Web: <a href="http://graduate.science.unimelb.edu.au/">http://graduate.science.unimelb.edu.au/</a> (<a href="http://graduate.science.unimelb.edu.au/">http://graduate.science.unimelb.edu.au/</a>)</p>
<b>Course Overview:</b>	<p>The Faculty of Science offers the Postgraduate Diploma in Science program through a number of departments.</p> <p>When a program includes a research project students who successfully complete the Postgraduate Diploma in Science with an H2A (75%) average are eligible to apply for Master of Philosophy or Doctor of Philosophy candidature. Where a coursework only option is chosen students are not eligible to apply for Master of Philosophy or Doctor of Philosophy candidature.</p> <p><b>Areas of Study</b></p> <ul style="list-style-type: none"> <li># <b><u>Anatomy &amp; Cell Biology</u></b></li> <li># <b><u>Botany</u></b></li> <li># <b><u>Chemistry</u></b></li> <li># <b><u>Computer Science</u></b></li> <li># <b><u>Oral Biology (Dental Science)</u></b></li> <li># <b><u>Earth Sciences</u></b></li> <li># <b><u>Genetics</u></b></li> <li># <b><u>History &amp; Philosophy of Science</u></b></li> <li># <b><u>Mathematics and Statistics</u></b></li> <li># <b><u>Medicine (St Vincent's Hospital)</u></b></li> <li># <b><u>Microbiology &amp; Immunology</u></b></li> <li># <b><u>Otolaryngology</u></b></li> <li># <b><u>Pathology</u></b></li> <li># <b><u>Pharmacology</u></b></li> <li># <b><u>Physics</u></b></li> <li># <b><u>Physiology</u></b></li> <li># <b><u>Vision Science</u></b></li> <li># <b><u>Zoology</u></b></li> </ul>
<b>Objectives:</b>	<p>Postgraduate Diploma programs are designed to:</p> <ul style="list-style-type: none"> <li># enable the acquisition of research skills (for example, laboratory techniques and data collection and analysis);</li> <li># engage students in research, under supervision;</li> <li># increase students' knowledge and understanding of the relevant discipline and awareness of current developments and issues relating to the discipline;</li> <li># develop independent and critical thinking; and</li> </ul>

	# improve oral and written communication skills.
<b>Course Structure &amp; Available Subjects:</b>	<p>The Postgraduate Diploma in Science course requires the completion of 100 points (100 points = one year of full-time study).</p> <p><b>Coursework and Research</b></p> <p>The 100 points comprises two components:</p> <ul style="list-style-type: none"> <li>• a coursework component (sometimes requiring the completion of up to 25 points of later-year, normally third-year, undergraduate subjects); and</li> <li>• a minor thesis research project component (normally 10 000 - 12 000 words).</li> </ul> <p>The weight of each component varies between departments.</p> <p>To be eligible for the award of the Postgraduate Diploma in Science, students must successfully complete both the research and the coursework components of the course.</p> <p><b>Coursework</b></p> <p>Students have the option to complete the Postgraduate Diploma in Science by coursework alone (100 point coursework option) in areas of study: Botany, Mathematics and Statistics, Physics.</p>
<b>Subject Options:</b>	<p><b>ANATOMY AND CELL BIOLOGY</b></p> <p><b>Coordinator</b> Associate Professor Colin Anderson</p> <p><b>Objectives</b></p> <p>The program in Anatomy and Cell Biology is designed to:</p> <p>Provide an introduction to advanced biomedical research in molecular, cell and systems biology;</p> <p>Enable the acquisition of current research skills in specific areas;</p> <p>Encourage the development of the abilities to think both independently and critically, through the continual analysis and evaluation of experimental data;</p> <p>Improve oral and written communication skills.</p> <p><b>Course Structure</b></p> <p>Anatomy Research Project (75 points) Content: An original, supervised research project. Assessment: A written report (thesis) at the end of the year.</p> <p>Anatomy Advanced Coursework (25 points) Content: Lectures and seminars covering a wide range of biomedical research. Lectures and workshops in topics such as animal welfare, library resources, experimental design and statistical analysis, writing skills and seminar preparation.</p> <p><b>Assessment:</b></p> <p>Attendance at lectures, workshops and seminars.</p> <p>A literature review (no more than 3000 words) which forms the basis of the introduction to the thesis. A journal review. An exam in statistics. An oral defence of the thesis.</p> <p>-</p> <p><b>BOTANY</b></p> <p><b>Coordinator</b> Associate Professor Rick Wetherbee</p> <p><b>Objectives</b></p> <p>The program in Botany aims to provide students with skills in original research in plant science and help students develop a capacity for critical thinking and evaluation of information. The course also strives to instil in students a knowledge of a wide area of plant sciences, and to enhance their communication skills.</p> <p><b>Areas of Specialisation</b></p>

The coursework and research components of this Postgraduate Diploma enable students to further their knowledge in areas of cellular and molecular biology, systematics and evolution, plant ecology and physiology, and plant pathology.

### **Course Structure**

The Botany program consists of a Research Project (75%) and Coursework (25%) or Coursework alone (100%).

### **Coursework and Research**

The research component is worth 75 points and is assessed from a written report (10 000 words maximum) which forms the basis of 60 per cent allocated of the year's assessment, with a further 10 per cent allocated on the basis of a 30 minute seminar presentation and another five per cent allocated on performance in an oral examination concerning the research project. The remaining 25 per cent of assessment is on the basis of coursework as follows: a literature review (3500 words), and two written or oral assignments focussing on topics presented in the series of advanced lectures (2500 words each), awarded a total of 25 points.

### **Coursework Component = 25 points**

Students will be enrolled in two x 12.5 coursework subjects from the list below in consultation with the Honours Coordinator:

- # BIOL90001 (600-651) Microscopy for Biological Sciences
- # EVSC90017 (600-654) Global Environmental Change
- # BOTA90005 (606-607) Flora of Victoria
- # BIOL90001 (600-651) Microscopy for Biological Sciences
- # SCIE90002 (600-650) Metabolomics and Proteomics
- # One third year Botany subject, for which credit has not already been given, or an alternative postgraduate coursework elective may be chosen if core knowledge is required.

### **Coursework (100%)**

Students must enrol in eight 12.5 point subjects available through the Master of Biotechnology, the Office for Environmental Programs and the Master of Forest Ecosystem Science. Subjects will be selected in consultation with the coordinator of the School's Masters program. Where appropriate, a student may complete up to two 300 level subjects.

-

## **CHEMISTRY**

### **Coordinator**

Associate Professor Craig Hutton

### **Administrator**

Ms Vicki Burley

### **Overview**

The Postgraduate Diploma in Chemistry program is designed to;

- \* increase the student's knowledge and understanding of chemical science;
- \* develop the process and practice of chemical research;
- \* encourage the development of individual investigative skills, critical thought and the ability to evaluate information and analyse experimental data;
- \* promote the acquisition of experimental or theoretical skills in areas currently relevant to one of the research groups in the School of Chemistry;
- \* improve oral and written communication skills; and
- \* ensure that students receive essential training skills in laboratory safety procedures.

### **Generic skills**

The Postgraduate Diploma in Chemistry program will provide students with the opportunity to establish/develop the following generic skills:

- \* an ability to evaluate scientific and professional literature;
- \* the ability to use conceptual models to rationalise experimental data;
- \* a capacity to articulate their knowledge and understanding in written and oral presentations;
- \* a capacity to manage competing demands on time, including self-directed experimental work;
- \* a capacity to enhance teamwork skills as required; and
- \* a respect for integrity in the conduct and reporting of scientific investigations.

**Admission requirements**

In addition to satisfying the Faculty of Science entry requirements, students interested in entering the Postgraduate Diploma in Chemistry program should typically have completed a Bachelor of Science degree which includes some third year chemistry subjects. However, all applications will be considered on a case-by-case basis by the coordinator.

**Course Structure**

This course can only be undertaken on a full-time basis and a mid-year intake is offered. Enrolment in the program is possible between either February and November or July and June.

**Assessment****Hurdle assessment requirements**

In addition to the Postgraduate Diploma in Chemistry requirements, students enrolled in this program must:

- \* attend all Safety and Induction program lectures and successfully complete the Safety Examination. Students who fail the Safety Examination will have to complete an additional study program and be reassessed. A pass in the Safety Examination is required before students can begin their laboratory work.
- \* submit a 1500-word literature survey and research plan during the first semester of enrolment.

**Components of assessment**

The course comprises a research project component and an advanced coursework component. Their relative weightings are as follows:

- \* Chemistry Research Project component = 62.5 percent
- \* Chemistry Advanced Coursework component = 37.5 percent

**Advanced Coursework**

Student will enrol in the following three subjects (each worth 12.5 points):

- \* CHEM90008 (610-681) Advanced Spectroscopy
- \* CHEM90009 (610-682) Chemical Synthesis and Characterisation 1
- \* CHEM90010 (610-683) Advanced Chemical Applications 1

**Research Project**

Students will enrol in the following research subjects:

- \* CHEM40008 (610-412) Chemistry Research Project 25 points in semester 1
- \* CHEM40009 (610-413) Chemistry Research Project 37.5 points in semester 2

The research project involves the completion of:

- \* A preliminary literature survey and research plan (1500 words, up to 5 pages), due towards the end of the first semester of study (pass/fail);
- \* A major thesis, page limit of 30 pages (10,000 words) due at the end of the second semester of study (90% made up from thesis evaluation (35%), oral examination (viva) on thesis (35%); supervisor's assessment of research performance (20%) based on attendance, application, initiative, and demonstrated skills);
- \* A project-related oral presentation (15 minutes presentation, 5 minutes discussion) to be scheduled during the second semester of enrolment (10%);and
- \* Successful completion of a seminar series providing advanced theoretical and/or practical training (pass/fail).

**Further information**

If you require further information about this program please contact:

Ms Vicki Burley  
Tel: +61 3 8344 6495

-

**COMPUTER SCIENCE****Coordinator**

Dr. Adrian Pearce

The program in Computer Science allows students to study a selection of topics in some depth and to work independently on a medium-sized project. It provides an introduction to research methodology and greater experience in system development. It may be used as a preparation

for postgraduate studies in computer science, and opens additional career opportunities in systems design and implementation and in research support.

The Postgraduate Diploma in Science is designed to:

- # allow students to study a selection of Computer Science topics in depth and to work on an investigative project;
- # provide an introduction to research methodology;
- # provide experience in system development;
- # improve career opportunities in research-oriented jobs, or in systems design and implementation;
- # encourage critical thought and novel ideas in computer science;
- # improve abilities to evaluate information and analyse experimental data;
- # improve oral and written communication skills.

It can be taken full time over 2 semesters or part-time over 4 semesters.

The course consists of 75% coursework and 25% research.

The coursework is shared with BCS (Hons) and BSc (Hons) in Computer Science.

#### **Coursework Component**

Students (full-time or part-time) must pass 6 subjects. Students can take one 600-level subject as part of their coursework. They can also take up to three 300-level subjects. A student can also ask the Honours Coordinator's permission to take a relevant 400-level subject outside the Department. Assessment consists of written assignments, oral presentations and written examinations.

#### **Thesis Component**

As well as advancing the student's knowledge of computer science, the Postgraduate Diploma is intended to introduce students to the world of research. Part way through their first semester, students will select a supervisor and project from a list of topics that academic staff have indicated they are willing to supervise. These projects involve a search of the relevant literature, some investigation or application by the student, and preparation of a final written report summarising the results of the investigation and its relation to other work in the area. Students are required to present a written summary of their project proposals towards the end of their first semester, and to give a final oral presentation of their research shortly after the deadline for theses. The thesis should not exceed 12,000 words. The thesis contributes 25% towards the final mark. The thesis will be examined by the supervisor and two other members of academic staff. Guidelines for marking will be made available to students.

#### **Seminars**

The Department of Computer Science and Software Engineering holds regular seminars; attendance at these is required for Postgraduate Diploma students. Other talks may also be recommended by the teaching staff; these, too, are considered to be part of the course.

#### **Entry Requirements**

To be eligible for the course, a student must have a three-year degree with substantial computing content as well as an average final-year mark at the level of at least the equivalent of 65. Industrial experience may also be taken into account. As a minimum, computing background should include solid experience with Unix and C programming, as well as good knowledge in the areas of data structures and algorithms for sorting, searching and graph manipulation, software development principles and tools, and software design, including object-oriented design. A student's computing background should also include good knowledge of several more specialised areas, such as artificial intelligence, computability and logic, operating systems, databases, human-computer interaction, computer networks, compilers, computer graphics, and software engineering. Finally, a student must have passed the equivalent of at least 25 points of 100-level Mathematics or Statistics.

-

### **ORAL BIOLOGY (DENTAL SCIENCE)**

#### **Overview**

We offer research within a multidisciplinary environment. Hence we welcome students from a variety of backgrounds including chemistry, biochemistry, biophysics, molecular biology, microbiology, immunology, genetics and anatomy. The research component offers students the opportunity to use state-of-the-art techniques in protein chemistry, molecular biology, microbiology, immunobiology, mass spectrometry, NMR spectroscopy, molecular modelling, skeletal biology, histomorphometry, aging of the skeleton and image analysis.

Web site: [http://www.dent.unimelb.edu.au/dsweb/postgrad\\_programs/honours.html](http://www.dent.unimelb.edu.au/dsweb/postgrad_programs/honours.html)  
([http://www.dent.unimelb.edu.au/dsweb/postgrad\\_programs/honours.html](http://www.dent.unimelb.edu.au/dsweb/postgrad_programs/honours.html))

### **Admission requirements**

Students must satisfy the Faculty of Science entry requirements. Information about the departmental entry requirements can be obtained from the department.

### **Coordinators**

Dr Laila Huq (academic)

Ms Kim Hanson (administrative)

### **Duration and commencement of course**

This program can be undertaken on a full-time basis only. The program commences in February and finishes in November.

### **Assessment**

#### **Components of assessment**

The program comprises a research project subject and an advanced coursework subject. These subjects with their relative weightings are as follows:

- # Dental Science: Oral Biology Research Project subject = 75 percent
- # Dental Science: Oral Biology Advanced Coursework subject = 25 percent

#### **Research project**

Students conduct an original research project supervised by a member of staff in one of the four research units within the School of Dental Science.

Current areas of major research activity with the school include the molecular biology of oral diseases and microbial pathogens, the cell biology and development of oral tissues, dental epidemiology, and the evaluation and development of novel dental restorative materials.

Students prepare a report (thesis) at the end of the period not exceeding 10,000 words

#### **Advanced coursework**

Students undertake:

- # lectures and seminars on selected topics of oral biology including oral molecular biology, oral microbiology, growth and development, oral biochemistry, biomaterials and biostatistics;
- # lectures or workshops on the critical analysis of a scientific paper, library resources, research design, and writing and communication skills;
- # participation in the school and research unit's research seminars;
- # an oral presentation of the aims and methods of the research project during the period, and a seminar to the school on the research project at the end of the period;
- # an essay of not more than 2000 words on a selected topic of dental science;
- # a written assignment (scientific critique of a journal article) of not more than 2000 words; and
- # written assignments based on the lecture series.

#### **Assessment:**

- # attendance at no less than 75 percent of lectures, workshops and seminars;
- # give an oral presentation of aims and methods of research project;
- # give an oral presentation to the School on the research project towards the end of second semester;
- # an essay of not more than 2000 words on a selected topic in dental science;
- # a written assignment (specific critique of a journal article) of not more than 2000 words; and
- # a written assignment or a two hour examination based on the lecture series.

#### **Further information**

If you require further information about this program please contact:

Dr Laila Huq

Tel: +61 3 9341 0821

Email: [l.huq@dent.unimelb.edu.au](mailto:l.huq@dent.unimelb.edu.au)

Ms Kim Hanson

Tel: +61 3 9341 1507

Email: [khanson@unimelb.edu.au](mailto:khanson@unimelb.edu.au)

-

## EARTH SCIENCES

### Coordinator

Associate Professor Kevin Walsh

The Postgraduate Diploma is designed to allow Earth Scientists to upgrade their skills and/or retrain by undertaking a year (or longer part time) of coursework and thesis studies. In addition, the Diploma is open to Science graduates with a background or work experience in Earth Sciences who wish to undertake further studies in Earth Science for business or pleasure. The Diploma studies are modular and available part-time to encourage participation from industry Earth Scientists.

### Objectives

- increase their knowledge and understanding of Earth Sciences and awareness of current developments and issues relating to studies of our planet
- develop independent and critical thinking skills
- improve oral and written communication skills

### Course Structure

The School of Earth Sciences offers a wide variety of one-week theory/practical or field studies from which to choose; typically there are 30 such short courses available each year, of which candidates must complete 12. These are offered within the formal 12.5 pt subjects listed for the MSc (Earth Sciences), all of which are available to Postgraduate Diploma students with authorisation from the coordinator. Please see the **MSc (Earth Sciences) handbook entry (.../view/current/MC-SCIEAR)**. This allows the Postgraduate Diploma candidate to specialise in a particular aspect of Earth Science or attain more broadly based expertise. #

In addition to the coursework requirement (75 points), the Postgraduate Diploma also requires the completion of a literature review and minor thesis (25 points).

Candidates who attain an average mark of over 65% may be eligible to upgrade their studies to the Master of Science Degree (MSc).

Two options are available regarding your research topic. 1) You may have your own research topic and dataset in mind, particularly if you are coming from industry. 2) You may wish to undertake a research project offered by one of the many academics within the School of Earth Sciences. In both cases you can contact the Postgraduate Coursework Coordinator directly at [mesc-coord@earthsci.unimelb.edu.au](mailto:mesc-coord@earthsci.unimelb.edu.au) (<mailto:mesc-coord@earthsci.unimelb.edu.au>) who will direct your enquiry to the appropriate specialist in the School of Earth Sciences, or you can investigate the Earth Sciences staff members on this website and contact them directly.

### Duration

The Postgraduate Diploma (PGrad Dip) can be completed full-time in one year (100 points) or part-time over several years, allowing industry Earth Scientists to attend courses in 2-6 week blocks to complete subjects and carry out thesis and literature review studies remotely, if necessary. International students must take the degree full-time. #The degree involves completion of 12 one week short courses, a literature review and a minor thesis.

### Entry Requirements

Admission is open to candidates with a Bachelor of Science degree specialising in Earth Sciences, or with a Bachelor of Science degree with a background or work experience in Earth Sciences. Candidates will usually commence studies at the beginning of February, but mid-year starts are also possible.

### Contacts

For more information see [www.earthsci.unimelb.edu.au](http://www.earthsci.unimelb.edu.au) (<http://www.earthsci.unimelb.edu.au/>) #

Or contact the postgraduate course coordinator - [mesc-coord@earthsci.unimelb.edu.au](mailto:mesc-coord@earthsci.unimelb.edu.au) (<mailto:mesc-coord@earthsci.unimelb.edu.au>)

-

## GENETICS

### Coordinator

Professor Jim Camakaris

## Objectives

On completion of this course students should have achieved:

- # A broad knowledge in the field of genetics;
- # A capacity to use experimentation in genetics to understand aspects of biology; and
- # A capacity to integrate various theoretical and experimental approaches to problems in genetics.

## Areas of specialisation

The coursework and research components of this Postgraduate Diploma in Science enable students to further their knowledge in the following areas: classical genetics; the history of genetics; population and evolutionary genetics; ecological genetics; molecular genetics; and developmental genetics. Typical research projects study aspects of heavy metal detoxification mechanisms in plants and animals; copper metabolism in mammals and the role of copper in neurodegenerative diseases; gene regulation in fungi;; the ecological, evolutionary and molecular genetics of insecticide resistance; evolutionary genetics; and developmental genetics.

## Course structure

Discipline Core subjects: (12.5 points)

Students must take either:

GENE90012 Advanced Topics in Genetics A; or

GENE90018 Advanced Topics in Genetics B

Elective subjects: (37.5 points)

BTCH90005 Advanced Molecular Biology Techniques

BTCH90009 Genomics and Bioinformatics

BIOL90001 Microscopy for Biological Sciences

SCIE90006 Scientists, Communication and the Workplace

MAST90044 Thinking and Reasoning with Data

Students can substitute up to 25 points of these with approved third year level Genetics subjects if this is recommended by the stream coordinator.

Research component: (50 points)

Research proposal (30%); minor thesis (70%).

-

## HISTORY AND PHILOSOPHY OF SCIENCE

### Coordinator

Dr. Kristian Camilleri

### Areas of Specialisation

Research projects can be accommodated in a variety of areas and prospective students should contact the coordinator for assistance with selection of a topic. The HPS program specialises in the following areas:

- History of the physical sciences
- Relations of science, philosophy and political thought in the early modern Europe and in the twentieth century
- History of medicine and the biomedical sciences
- Metaphysics of scientific realism
- Epistemic naturalism
- The idea of 'Nature' in the context of contemporary environmental and human sciences
- How science might generatively engage other knowledge traditions
- Social context of computer-based technologies

### Course structure

The course consists of a 12 000 word supervised research project (37.5%) and a coursework component of five of the Department's honours and postgraduate level seminars (each weighted 12.5%, and requiring the equivalent of 5000 words each). The seminars may be chosen from the following:

- HPSC40002 (136-442) Directed Study (semester 1 or 2)
- HPSC40014 (131-498) Science and Ideology in the 20th Century (semester 1)
- HPSC40012 (136-544) Beyond the Spin: Techno-scientific Failure (semester 2)
- HPSC40011 (136-400) Medicine and Culture (semester 1)
- HPSC90010 (136-527) Environment and Knowledge (semester 1)
- PHIL40001 (136-536) Realism, Relativism and Naturalism (semester 2)



- HPSC40013 (161-430) The Western Tradition & its Discontents (semester 2)
- HPSC40010 (136-542) HPS Thesis (semester 1 and 2)

Students may choose a maximum of two honours subjects in philosophy as electives from the following:

- PHIL40005 (161-434) Metaphysics and Epistemology (semester 2)
- PHIL40013 (161-447) Uncertainty, Vagueness and Disagreement (semester 2)

-

## MATHEMATICS AND STATISTICS

### Coordinator

Dr. Omar Foda

### Entry Requirements

Prior study requires at least two first year and three second or higher level Mathematics and Statistics subjects. If students have completed accelerated subjects one fewer subject can be deemed appropriate.

### Objectives

The objectives of this diploma are to

- \* Further the understanding of Mathematics and Statistics across a wide range of theoretical and practical topics;
- \* Encourage the development of abilities to think critically and independently;
- \* Provide a pathway for entry into graduate study in Mathematics and Statistics for students whose main undergraduate field of study was not Mathematics and/or Statistics.

### Course Structure

The Mathematics and Statistics program consists of Coursework (eight subjects) (100%).

### Coursework

Students must complete eight 12.5 point subjects as indicated below.

Subjects are chosen from three sources.

Firstly, subjects are chosen from advanced discipline subjects available to students enrolled into Master of Science (Mathematics and Statistics).

The advanced discipline subjects are clustered into four areas:

1. Applied Mathematics & Mathematical Physics
2. Operations Research & Discrete Mathematics
3. Pure Mathematics
4. Statistics & Stochastic Processes

Students usually take at least three advanced subjects from a single area.

Secondly, students may choose the subject MAST90045 (600-617) Systems Modelling and Simulation.

Thirdly, up to four subjects may be chosen from latter-year, normally third year, undergraduate Mathematics and Statistics subjects, subject to approval by the Departmental Program Coordinator.

-

## MEDICINE (ST VINCENT'S HOSPITAL)

### Coordinator

Dr. Sue Rogers

### Objectives

- # To develop further knowledge and skills in the area of biomedical science, including experimental design, laboratory techniques, data analysis and interpretation and oral and written presentation.
- # To complete a research project, which involves carrying out individual project work under the supervision of a nominated supervisor.
- # To attend departmental seminars and complete appropriate coursework and assignment.

### Course Structure

Research Project (75 points)

**Advanced Coursework (25 points)**

**Content:** An original, supervised research project in the field of biomedical science.

**Assessment:**

Completion of a Literature Review (5000 words)

Undertake Oral Presentations

Attendance at Biomedical Statistics program and submit written assignment

Completion of set coursework/assignment

Submission of thesis (10 000 words)

Supervisor/lab competence assessment

-

**MICROBIOLOGY AND IMMUNOLOGY****Coordinators**

Dr. Mike Dyll-Smith

Dr. Odilia Wijburg

Dr. Stephen Turner

**Objectives**

The Postgraduate Diploma in Science program in Microbiology and Immunology is designed to

- # Train students to plan and carry out original experiments and to rigorously interpret results;
- # Facilitate students' ability to analyse and communicate scientific results and ideas, both those generated by their own work and those reported by others;
- # Engender an enthusiasm for scientific inquiry;

And

- # Encourage each individual to develop skills requiring both analytical and creative thought.

**Areas of Specialisation**

The coursework and research components of this Postgraduate Diploma in Science enable students to further their knowledge in some of the following areas: Microbiology (including Virology, Bacteriology and Parasitology), Biotechnology, Immunology, and Environmental Microbiology.

**Course Structure**

Research Points (75 points)

This comprises an original, supervised research project and report and an oral presentation.

**Assessment:**

A written report (thesis) and oral presentation will be assessed at the end of the year.

**Coursework (25 points)**

This comprises lectures and seminars on selected topics within microbiology and immunology, discussion of research data and its interpretation, detailed study of original literature, and one or more oral presentations and literature surveys on selected topics.

**Assessment:**

Written examinations, literature survey and/or seminar presentations.

To successfully complete the Postgraduate Diploma in Science program in Microbiology and Immunology students must obtain passes of 50 per cent or better in both the Research Project and Coursework. In order to apply for higher degrees, students must obtain 75 per cent or better in both the Research Project and Advanced Coursework.

-

**OTOLARYNGOLOGY****Coordinator**

Dr. Karina Needham

**Course Structure**

Research Project (75 points)  
Advanced Coursework (25 points)

Content: An original, independent research project on a hearing-related topic of science or biomedicine conducted under the supervision of an academic mentor (research project); Lectures, tutorials and seminars covering a diverse range of hearing-related and biomedical research topics (advanced coursework)

#### **Assessment**

A written literature review (3000 words), research report (12,000 words), oral presentations, and short assignments.

-

## **PATHOLOGY**

### **Postgraduate Diploma Of Science program**

The Postgraduate Diploma program in the Department of Pathology provides an introduction to the challenging area of investigation of disease at the cellular and molecular level. This program involves candidates undertaking a full-time research project based in a laboratory within the Department of Pathology or at one of our affiliated institutions. A student undertaking a Postgraduate Diploma Research Project will have an interest in understanding the mechanisms of disease.

#### **Academic Coordinators**

Dr Joe Ciccotosto ([jcicco@unimelb.edu.au](mailto:jcicco@unimelb.edu.au) (<mailto:jcicco@unimelb.edu.au>))

Dr Vicki Lawson

Dr Anthony White

#### **Objectives**

The objectives of the course include the development of the individual student's skills in the areas of acquisition, interpretation and critical analysis of laboratory data, planning and design of experiments and reporting of experimental data in a concise and scientific manner consistent with that published in scientific journals.

#### **Areas of Specialisation**

A wide range of research projects are offered through the department in the areas including -regulation of inflammatory processes, immunology, transplantation, neurosciences, genetic epidemiology, and cellular and genetic strategies for control and detection of neoplasia.

#### **Course Structure**

Pathology Research Project (75 points)

Advanced Coursework including -

Critical Analysis of Pathology Research (12.5 points)

Introduction to Biomedical Research (12.5 points)

#### **Content**

- The Research Project subject includes the completion of a novel laboratory based research project under the direct supervision of academic or research staff within, or affiliated with, the Department of Pathology.
- An advanced lecture series and tutorials designed to help students develop critical analysis skills that can be used in their research project and advanced coursework assessment tasks. These critical analysis skills will also be invaluable to students as they pursue their research careers.

#### **Assessment**

Pathology Research Project:

- An introductory seminar outlining the projects hypothesis, aims and proposed methodology is presented to the Department.
- A critical review of literature relevant to the research project is submitted as a hurdle assessment at mid-year and an updated version submitted with the final research project report.
- The research project report is based on research work undertaken in the laboratory and is prepared as a thesis report and submitted at the end of the year.
- A defence-of-thesis seminar is presented to the Department after submission of the research thesis.

Advanced Coursework:

- Critical analysis of Pathology Research subject is assessed by students completing a four-hour data assessment examination and presenting a journal club paper.

- The Introduction to Biomedical Research subject is assessed by students submitting four written reports (each not exceeding 2000 words) submitted during the semester.

-

## PHARMACOLOGY

### Academic Coordinator

Associate Professor Christine Wright

[cewright@unimelb.edu.au](mailto:cewright@unimelb.edu.au) (mailto:cewright@unimelb.edu.au)

### Administrative coordinator

Hong Nguyen

[hongn@unimelb.edu.au](mailto:hongn@unimelb.edu.au) (mailto:hongn@unimelb.edu.au)

### Objectives

This Postgraduate Diploma program in Pharmacology is designed to offer suitably qualified students that do not have a BSc degree an understanding of advanced pharmacological theory and to provide an introduction to pharmacological research. Emphasis is placed on developing skills in experimental design, technical expertise, thinking, analysis and presentation skills that will enable students to consider a career in medical research.

### Areas of Specialisation

The coursework covers topics in analytical pharmacology, molecular pharmacology, and the basis of drug design and action. Strong emphasis is placed on research training.

### Course Structure

Coursework (37.5 points)

The Coursework subject comprises lectures and tutorials in pharmacology.

Assessment: Written assessment of lecture and tutorial material (20%), a manuscript evaluation (10%) and a review writing exercise (7.5%)

Research Project (62.5 points)

An original, supervised research project

### Assessment:

A written thesis of maximum 6000 words excluding figures, tables and references (50%) and two oral presentations (12.5%).

-

## PHYSICS

### Coordinator

Dr. Nicole Bell

### Objectives

The program in Physics is designed to:

- \* increase students' knowledge of physics on a broad front and to a professional level;
- \* introduce students to the current research literature in specialized areas; and
- \* engage students in their own research by participation in the activities of a research group in the School of Physics.

### Course Structure

The Physics program consists of a Research Project (50 points) and Coursework (50 points), or Coursework (100 points)

### Research (50 points)

Content:

An original, supervised research project (experimental and/or theoretical) in one of the School's current fields: astrophysics, condensed matter physics, optical physics, particle physics and quantum physics.

Assessment:

A written report on the research performed during the year. Preparation and delivery of a 15 minute talk to the School of Physics on the research work.

### Coursework (50 points)

Students must complete four 12.5 point subjects. Students should select subjects from the following list in consultation with the Program Coordinator:

PHYC90007 (640-610) Quantum Mechanics  
 PHYC90008 (640-611) Quantum Field Theory  
 PHYC90012 (640-614) General Relativity  
 PHYC90010 (640-604) Statistical Mechanics  
 PHYC90013 (640-615) Condensed Matter Physics  
 PHYC90011 (640-613) Particle Physics  
 PHYC90009 (640-612) Physical Cosmology  
 PHYC90006 (640-603) Quantum and Advanced Optics

Students may substitute at most two approved subjects at 300 level or higher.

#### **Coursework (100%)**

Students must complete eight 12.5 point subjects. Students should select subjects from the following list in consultation with the Program Coordinator:

PHYC90007 (640-610) Quantum Mechanics  
 PHYC90008 (640-611) Quantum Field Theory  
 PHYC90012 (640-614) General Relativity  
 PHYC90010 (640-604) Statistical Mechanics  
 PHYC90013 (640-615) Condensed Matter Physics  
 PHYC90011 (640-613) Particle Physics  
 PHYC90009 (640-612) Physical Cosmology  
 PHYC90006 (640-603) Quantum and Advanced Optics

Students may substitute at most four approved subjects at 300 level or higher.

-

## **PHYSIOLOGY**

### **Coordinator**

Associate Professor Graham Barrett

### **Objectives**

The program in physiology is designed to:

- enhance students' knowledge and understanding of the principles of the control of body function and the current development in a specific area of interest;
- engage students in research in a structured and supervised environment;
- introduce students to the professional skills required of a successful physiologist (grant writing, critical appreciation of scientific writing, peer communication); and
- develop the processes of independent, lifelong learning using the scientific literature.

### **Areas of Specialisation**

Research within the department is grouped into three areas of specialization:

- Cardiovascular Health: Cardiac Phenomics, Central Cardiovascular Regulation, Fetal, Postnatal & Adult Physiology and Disease, Genes & Blood Pressure.
- Muscle & Exercise: Exercise Muscle & Metabolism, Basic & Clinical Myology, Confocal & Fluorescence Imaging;
- Neurophysiology: Enteric Neuroscience, Molecular Neuroscience.

### **Course Structure**

Research (75 points):

PHYS40005 (536-494) Physiology Research Project (25 points, Semester 1)

PHYS40006 (536-495) Physiology Research Project (50 points, Semester 2)

This involves undertaking an original, supervised research project. A written report (thesis), not exceeding 10 000 words, is to be submitted at the end of the program. In addition, assessment includes two oral presentations and a literature review.

Advanced Coursework (25 points):

BIOM40001 Introduction to Biomedical Research (12.5 points, Semester 1)

PHYS90008 (536-502) Advanced Seminars in Physiology (12.5 points, Semester 1)

-

## **VISION SCIENCE**

### **Coordinator**

Dr. Larry Abel

## Objectives

The course provides advanced training in vision science or optical science, and preliminary training in research methods.

## Structure

The course comprises a research project subject and an advanced coursework subject. These subjects, and their relative weightings in the 100-point course, are as follows:

- # Vision Science Research Project subject = 75 percent
- # Vision Science Advanced Coursework subject = 25 percent

## Research project

Under the supervision of an academic staff member, students conduct research and prepare a report in the form of a thesis not exceeding 15,000 words.

A list of the research interests of the Department is available in the document, Research Areas in Optometry and Vision Sciences, from the Department Office or on the Department's website (<http://www.optometry.unimelb.edu.au/research/labs.html>). Potential students should approach the Postgraduate Coordinator or specific academic staff in the areas of research interest to discuss possible research projects. Further guidelines for thesis formatting, etc., are provided in the Department's Honours/Postgraduate Diploma manual distributed at the commencement of the course.

The thesis is normally due for submission in the first week of November (for students who commenced at the beginning of the year), or in the first week of May (for students who commenced mid-year). The student's supervisor will provide a mark (10% of the research project mark) that reflects the student's performance in the laboratory. The examiners will normally include the Postgraduate Coordinator and one other member of the Department's academic staff, and they will provide a mark for the thesis (80% of the research project mark). The thesis examiners will also assess student's oral presentation made after the thesis has been submitted (10% of the research project mark).

A 20-minute oral presentation at each of two Honours/Postgraduate Diploma mini-symposia during the course is also a hurdle requirement: (i) a presentation during the first 2 months of commencement outlining the planned research project; (ii) a presentation following the submission of the written research project presenting the key outcomes.

## Advanced coursework

In addition, students enrolled in the program are required to attend and participate in Departmental seminars, including the Vision Science Seminar Series and Journal Club.

Students are required to undertake the compulsory Advanced Research Methods subject plus one other elective module (each component contributes 50% to the total coursework mark):

- # (semester two, compulsory) Advanced Research Methods: a directed learning module which runs in conjunction with the Department's Journal Club. Students will be required to participate in web based blogs and discussion forums led and moderated by an academic staff member to discuss issues of research practice or methodology related to the Journal Club presentations. Assessment for this module is based on a series of written tasks completed throughout the semester (detailed on the Department's website [www.optometry.unimelb.edu.au/current/honours.html](http://www.optometry.unimelb.edu.au/current/honours.html) (<http://www.optometry.unimelb.edu.au/current/honours.html>));

Plus an elective subject:

- # (semester one or two) An elective subject, normally chosen from the Department's coursework listings at 300-level or above. Assessment for each subject is specified in the Handbook. This is particularly suitable for students who have not previously studied vision science or optics.

If a student is unable to choose a subject from the Department, the student's supervisor will assist the student to choose a coursework subject at 300-level or above from other departments at the University of Melbourne.

However if a student is still unable to choose a subject from the departments, the following option may be taken.

- # (semester one) A literature-based assignment not exceeding 4,000 words. The assignment topic, which is to be decided upon in consultation with the student's supervisor and the Postgraduate coordinator, is to be drawn from a different but possibly related area to the research project. The student's supervisor and one other member of the Department's academic staff will assess the assignment.

	<p><b>Further information</b></p> <p>Information about departmental research areas is available on the Department's website (<a href="http://www.optometry.unimelb.edu.au/research/labs.html">http://www.optometry.unimelb.edu.au/research/labs.html</a>) (<a href="http://www.optometry.unimelb.edu.au/research/labs.html">http://www.optometry.unimelb.edu.au/research/labs.html</a>).</p> <p>-</p> <p><b>ZOOLOGY</b></p> <p><b>Coordinator</b></p> <p>Dr. Graeme Coulson</p> <p><b>Objectives</b></p> <p>The program in Zoology is a course of advanced study and research occupying a full year. It is designed to give students an understanding of the research base underpinning modern zoological science. It also introduces students to hands-on research either in the field or in the laboratory, and will enable them to acquire current research skills in different areas of biological sciences.</p> <p><b>Areas of Specialisation</b></p> <p>The coursework and research components of this Postgraduate Diploma in Science allow students to tailor a program to further their knowledge of any of the research strengths of the Department in areas ranging from the structure and function of single cells through to the ecology, reproduction and evolution of animals, with special expertise in the following areas: population and community ecology, wildlife management, animal behaviour, conservation and climate change, environmental stress and adaptation, marine biology, reproductive physiology and developmental biology.</p> <p><b>Course Structure</b></p> <p>The course consists of advanced coursework (25%) and a major research project (75%). Coursework includes lectures and tutorials on experimental design and analysis, seminars in contemporary issues in zoology and workshops on oral and written communication skills.</p> <p>Assessment is based on a research report of no more than 7,500 words (70%), a final oral presentation (5%) and coursework (25%).</p> <p><b>Entry Requirements</b></p> <p>An undergraduate degree in a relevant discipline. Entry is also subject to the availability of an appropriate research topic and supervisor.</p>
<b>Entry Requirements:</b>	An undergraduate degree in a relevant discipline. Entry is also subject to the availability of an appropriate research topic and supervisor.
<b>Core Participation Requirements:</b>	<p>The Postgraduate Diploma in Science welcomes applications from students with disabilities. It is University and degree policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the degree. The Postgraduate Diploma in Science requires all students to enrol in subjects where they will require: (1) the ability to comprehend complex science and technology related information; (2) the ability to clearly and independently communicate a knowledge and application of science, and technology principles and practices during assessment tasks; (3) the ability to actively and safely contribute in clinical, laboratory, and fieldwork/excursion activities. Students must possess behavioural and social attributes that enable them to participate in a complex learning environment. Students are required to take responsibility for their own participation and learning. They also contribute to the learning of other students in collaborative learning environments, demonstrating interpersonal skills and an understanding of the needs of other students. Assessment may include the outcomes of tasks completed in collaboration with other students. There may be additional inherent academic requirements for some subjects, and these requirements are listed within the description of the requirements for each of these subjects. Students who feel their disability will impact on meeting this requirement are encouraged to discuss this matter with the relevant Subject Coordinator and the Disability Liaison Unit: <a href="http://www.services.unimelb.edu.au/disability/">http://www.services.unimelb.edu.au/disability/</a></p>
<b>Further Study:</b>	Students who successfully complete the coursework and research Postgraduate Diploma in Science courses with an H2A (75%) average are eligible to apply for M.Phil - Science and PhD- Science candidature.

	Students who successfully complete the coursework (100%) Postgraduate Diploma in Science courses are not eligible to apply for M.Phil - Science and PhD-Science candidature.
<b>Links to further information:</b>	<a href="http://graduate.science.unimelb.edu.au">http://graduate.science.unimelb.edu.au</a>