Graduate Diploma in Applied Science (Medical Physics)
(PH71)

Overview
The Graduate Diploma/Master of Applied Science (Medical Physics) deals with well-established and emerging areas of medical and health physics and includes the following topics: clinical measurement, computing, health physics, instrumentation, medical electronics, medical imaging, physiological monitoring, physics of radiotherapy, radiobiology, radiological imaging sciences.

The coursework also contains an introduction to the clinical sciences. From this, prospective medical physicists learn to appreciate the clinical nature of medical situations and how to communicate better with other clinical staff.

Graduates can seek employment in hospitals, health departments, mining companies, tertiary institutions and medical instrumentation companies. Depending on the field of employment, graduates may be known as a medical physicist, health physicist or bio-engineer. Duties as a professional medical physicist include:

- applying electronics, ultrasonics, radiation and computers to clinical and environmental problems
- monitoring the environment to maintain acceptable standards in the workplace and the community
- applying fundamental physical research in development programs
- responsibility for calibration, care and maintenance of instruments and apparatus.

Further Information
For further information about this course, please contact:

Dr Andrew Fielding
Phone: +61 7 3138 2782
Email: enquiry.scitech@qut.edu.au

Course structure - First Semester Entry - Full-time Course

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<th>Year 1, Semester 1 (February to June)</th>
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<td>LSB142 Human Anatomy and Physiology</td>
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<tr>
<td>PCN113 Radiation Physics</td>
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<td>PCN114 Microprocessors and Instrumentation</td>
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<td>PCN211 Physics of Medical Imaging</td>
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<th>Year 1, Semester 2 (July to October)</th>
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<td>PCN112 Medical Imaging Science</td>
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Entry Requirements
Applicants must possess an acceptable tertiary course with a major in physics. Applicants with other qualifications (eg engineering) may enrol with the approval of the Head of the School of Physical and Chemical Sciences. In some instances, a modified program may be necessary.

Course Design
This degree comprises assessed coursework such as advanced lectures, seminars, reading courses or independent study. If undertaken full-time, students will need an average of 14 hours a week of formal contact.

Students who have completed the Graduate Diploma may enter Stage 2 of the Master of Applied Science - PH80 where they undertake a program of supervised research and investigation that can be completed at QUT, or in a suitable external institution.

Professional Recognition
The course has been accredited by the Australasian College of Physical Sciences and Engineers in Medicine (ACPSEM) and graduates of the course will receive exemptions for the academic requirements of the ACPSEM Training, Education and Accreditation Program (TEAP) for Medical Physicists. Full exemption will be granted for the Master of Applied Science and coursework component exemption will be granted for the Graduate Diploma. The TEAP is a 5 year registrar training program leading to accreditation as a Medical Physicist and further details may be found at www.acpsem.org.au.
**Course structure - First Semester Entry - Part-time Course**

| Year 1, Semester 1 (February to June) | LSB142 Human Anatomy and Physiology | PCN113 Radiation Physics |
| Year 1, Semester 2 (July to October) | PCN112 Medical Imaging Science | PCN114 Microprocessors and Instrumentation |
| Year 2, Semester 1 (February to June) | PCN114 Microprocessors and Instrumentation | PCN211 Physics of Medical Imaging |
| Year 2, Semester 2 (July to October) | PCN214 Health and Occupational Physics | PCN218 Research Methodology and Professional Studies |

**Course structure - Mid-Year Entry - Full-time Course**

| Year 1, Semester 2 (July to October) | LSB182 Bioscience 1 | PCN112 Medical Imaging Science |
| Year 2, Semester 1 (February to June) | PCN113 Radiation Physics | PCN114 Microprocessors and Instrumentation |
| PCN218 Research Methodology and Professional Studies |
| PCN211 Physics of Medical Imaging |

**Course structure - Mid-Year Entry - Part-time Course**

| Year 1, Semester 2 (July to October) | LSB182 Bioscience 1 | PCN112 Medical Imaging Science |
| Year 2, Semester 1 (February to June) | PCN113 Radiation Physics | PCN114 Microprocessors and Instrumentation |
| PCN218 Research Methodology and Professional Studies |
| PCN211 Physics of Medical Imaging |

**Potential Careers:**
Health Physicist, Medical Equipment Sales, Medical Physicist.

**UNIT SYNOPSES**

**LSB142 HUMAN ANATOMY AND PHYSIOLOGY**
The aim of this unit is to provide grounding in the principles of human anatomy and physiology. Following an introduction to the structure of the cell and the organisation of tissues, each of the major systems that constitute the human body are examined by the integrated study of their anatomy and physiology.

**Antirequisites:** LSB131, LSB182, LSB258

**Credit points:** 12

**Contact hours:** 4 per week

**Campus:** Gardens Point

**Teaching period:** 2010 SEM-1

**LSB182 BIOSCIENCE 1**
This unit develops an understanding of normal human structures in relation to their functions at the cellular, tissue and organ levels. This is a foundation course in anatomy and physiology for nursing students. Topics covered are: the cell, tissues; systems of the body and their functions; surface anatomy and body topography; musculoskeletal adaptations; posture control and balance.

**Antirequisites:** LSB131, LSB142

**Credit points:** 12

**Contact hours:** 4 per week

**Campus:** Kelvin Grove and Caboolture

**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**PCN112 MEDICAL IMAGING SCIENCE**
This unit offers an introduction to programming techniques and algorithms and digital image processing; the principles of display, perception and interpretation of medical images; image quality. The second part, nuclear medicine, describes radioactive decay, radionuclide production, imaging systems and internal dosimetry.

**Credit points:** 12

**Contact hours:** 4 per week

**Campus:** Gardens Point
PCN113 RADIATION PHYSICS
This unit includes the following: radioactivity and the interaction of ionising radiation with matter; applied radiation counting techniques; radiation detectors; radiation dosimetry.
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

PCN114 MICROPROCESSORS AND INSTRUMENTATION
This unit includes the capabilities and limitations of a given instrument; design of interfaces between microcomputers and transducers; signal conditioning and signal conversion circuits for data acquisition.
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

PCN211 PHYSICS OF MEDICAL IMAGING
This unit addresses the physical principles involved in the production of radiographic, ultrasonic and magnetic resonance images, and quality control protocols.
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

PCN212 RADIOTHERAPY
This unit provides an overview of the application of physics to radiotherapy including theoretical and practical aspects of the major topics in radiotherapy physics.
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

PCN214 HEALTH AND OCCUPATIONAL PHYSICS
This unit introduces the philosophy, protocols and practices of safety in the medical and industrial physics fields and the minimisation of hazards associated with radiation, and laser techniques.
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

PCN218 RESEARCH METHODOLOGY AND PROFESSIONAL STUDIES
In the rapidly changing technological environment of medical physics and medical ultrasound it is essential that students develop basic research skills, data interpretation skills and written communication skills. Topics include the research process, data collection and analysis techniques, and writing and evaluating research reports. Students also require knowledge of the professional, basic management, legal and ethical issues involved in their particular speciality area. Topics include the role and purpose of professional bodies, professional communication, legal and ethical issues, and basic professional management techniques and issues.