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

**Year offered:** 2011  
**Admissions:** Yes  
**CRICOS code:** 020315D  
**Course duration (full-time):** 2 semesters (1 year)  
**Course duration (part-time):** 4 semesters (2 years)  
**Domestic Fees (indicative):** 2011: CSP $3,878 (indicative) per semester  
**International Fees (indicative):** 2011: $11,000 (indicative) per semester  
**Domestic Entry:** February and July  
**International Entry:** February and July  
**Total credit points:** 96  
**Standard credit points per full-time semester:** 48  
**Standard credit points per part-time semester:** 24  
**Course coordinator:** Dr Andrew Fielding  
**Campus:** Gardens Point

**Career Outcomes**
Graduates can seek employment in hospitals, health departments, 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.

Professional medical/health physicists:  
- apply electronic tools and medical software, ultrasonics, radiation and computers to clinical and environmental problems  
- monitor the environment to maintain acceptable standards in the workplace and the community  
- apply fundamental physical research in development programs  
- are responsible for calibration, care and maintenance of instruments and apparatus.

**Course Design**
Stage 1— Graduate Diploma (PH71) comprises assessed coursework such as advanced lectures, seminars, reading units or independent study. Full-time students will need an average of 14 hours a week of formal contact (seven hours for part-time students). Students can graduate with a Graduate Diploma in Medical Physics after satisfactory completion of Stage 1.

Stage 2— Master of Applied Science (PH80) students undertake a program of supervised research and investigation that can be completed at QUT or in a suitable external institution.

**Professional Recognition**
The course is accredited by the Australasian College of Physical Sciences and Engineers in Medicine.

**Limits on grades of 3**
A new policy concerning grades of 3 came into effect from 1 January 2009 (QUT MOPP C/5.2). With effect from this date grades of 3 are no longer considered a conceded or low pass but are classified as a fail grade. Any grades of 3 awarded prior to 1 January 2009 retain the conceded pass status and will be counted for graduation purposes up to the maximum number of grades of 3 permitted for your course. Grades of 3 incurred in units that commence after 1 January 2009 will not count towards your degree. Further information is available on the Student Services website.

**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**

<table>
<thead>
<tr>
<th>Year 1, Semester 1 (February to June)</th>
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<tbody>
<tr>
<td>LSB142 Human Anatomy and Physiology</td>
</tr>
<tr>
<td>PCN113 Radiation Physics</td>
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<tr>
<td>PCN114 Microprocessors and Instrumentation</td>
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<tr>
<td>PCN211 Physics of Medical Imaging</td>
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<tr>
<th>Year 1, Semester 2 (July to October)</th>
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<tr>
<td>PCN112 Medical Imaging Science</td>
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<tr>
<td>PCN212 Radiotherapy</td>
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<tr>
<td>PCN214 Health and Occupational Physics</td>
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<tr>
<td>PCN218 Research Methodology and Professional Studies</td>
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**Course structure - First Semester Entry - Part-time Course**

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<th>Year 1, Semester 2 (July to October)</th>
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<tbody>
<tr>
<td>PCN112 Medical Imaging Science</td>
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Potential Careers:
Health Physicist, Medical Equipment Sales, Medical Physician.

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 and Kelvin Grove  
*Teaching period*: 2011 SEM-1

**LSB182 BIOSCIENCE 1**
The aims of this unit are to provide you with a clear understanding of anatomical terminology used in the health professions; provide you with a strong background enabling you to apply concepts of anatomy, physiology, microbiology and introductory pharmacology to your future studies of diseases and their treatment; provide an introduction to infectious agents that impact on human health and infection control.

*Antirequisites*: LSB131, LSB142  
*Credit points*: 12  
*Contact hours*: 5 per week  
*Campus*: Kelvin Grove and Caboolture  
*Teaching period*: 2011 SEM-1 and 2011 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  
*Teaching period*: 2011 SEM-2

**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*: 2011 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:** 2011 SEM-1

**PCN211 PHYSICS OF MEDICAL IMAGING**

Most medical imaging modalities now produce images in digital form. These digital images frequently undergo processing such as enhancement, registration, fusion and 3D reconstruction. Digital image processing and 3D image visualisation techniques are also extensively used in nuclear medicine and radiotherapy planning. Consequently, computing, numerical methods and digital image processing are necessary skills of a practising medical physicist. This unit is designed to make the student familiar with image visualisation methods and imaging in nuclear medicine, and to develop skills in digital image processing.

**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 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:** 2011 SEM-2

**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:** 2011 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.

**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1 and 2011 SEM-2