Bachelor of Applied Science - Medical Radiation Technology (Medical Imaging Technology) (PH38)

Year offered: 2011
Admissions: No
CRICOS code: 037588F
Course duration (full-time): 3 Years
Domestic Fees (indicative): 2011: CSP $3,878 (indicative) per semester
International Fees (indicative): 2011: $11,250 (indicative) per semester
Domestic Entry: February. For 2011 entry, please refer to ST30 Bachelor of Medical Imaging Science
International Entry: February - IELTS of 7.0 with no subscore less than 7.0, or its equivalent Occupational English Test
QTAC code: 418182
Past rank cut-off: 96
Past OP cut-off: 3
Assumed knowledge: English (4, SA), Maths B (4, SA) and Physics (4, SA)
Preparatory studies: For information on acquiring assumed knowledge visit http://www.qut.edu.au/assumed-knowledge
Total credit points: 288
Standard credit points per full-time semester: 48
Course coordinator: Associate Professor Pam Rowntree
 Discipline coordinator: Mrs Debbie Starkey
Campus: Gardens Point

Overview
QUT is currently the only university in Queensland to offer a medical imaging technology undergraduate qualification. This course leads to employment as a medical imaging technologist or diagnostic radiographer, a rewarding profession with excellent employment prospects. Radiographers play an important role in the health-care sector, providing vital information to assist with the diagnosis and treatment of medical disorders.

Career Outcomes
As a radiographer you will play a key role in patient care by providing referring medical practitioners with additional diagnostic information to assist in patient management and treatment. You may become a team member in a radiology department in a hospital, private radiology practice or health department, or you may be employed in medical equipment sales.

Professional Recognition
On graduation, you will be eligible for provisional accreditation by the Australian Institute of Radiography. Full accreditation requires the completion of an additional professional development year of clinical experience.

English Language Skills Applicable to health practitioners applying for registration)
All applicants must be able to demonstrate English language skills at IELTS academic level 7 or equivalent. Test results from examinations will generally need to be obtained within two years prior to applying for registration.

Other Course Requirements
You are required to undertake clinical experience in hospital departments and private practices during the course and, as a result, will have direct patient contact during the clinical placement, and may be exposed to blood and body fluids of patients. You must be vaccinated for Hepatitis B and must provide a postvaccination pathological report or similar certification showing proof of immunity prior to undertaking the first clinical placement.

Cardiopulmonary resuscitation (CPR) certification is also required to undertake clinical placements. In addition, you must satisfy criteria related to health status. You should declare height, physical disabilities, treatment of nervous condition, any drug/alcohol disorder, and a current immunisation status (specifically Hepatitis B) as part of the online enrolment process.

A current Blue Card authorised with QUT may be required prior to commencing the clinical placement components of this course. For more information visit www.bluecard.qut.edu.au, and ensure that you allow adequate time for processing your application and issuing of the card in order to avoid clinical experience delays.

Your Course
Year 1
You will develop a solid grounding in anatomy and medical physics along with introductory knowledge of patient health-care needs, professional communication techniques and ethical, legal and accountability issues. Introductory studies in medical radiation technology are complemented with practical sessions in QUT’s medical imaging laboratories, allowing you to develop your skills in patient positioning and image production for skeletal radiography.

Year 2
Building on your introductory units, you will progress to more advanced and specialised study of human anatomy...
including diseases of the organ systems, obstetrics, gynaecology, central nervous system, paediatrics and geriatrics. Specialised practical sessions in QUT’s facilities will focus on regional anatomy of the head, neck, upper limb and lower limb. You will learn about the specialist techniques of mammography, tomography, trauma radiography, and ward and operating theatre radiography. In each semester you will have an opportunity to practise your skills in a real workplace through placements in clinical departments.

**Year 3**
You will continue to develop your skills through clinical placements in hospitals or private practices. At QUT, you will undertake theoretical and practical classes in advanced techniques such as angiography, and interventional techniques. In-depth knowledge of the uses and applications of X-ray computed tomography (CT) and magnetic resonance imaging (MRI) will be covered along with valuable techniques in digital image processing. You will round off your professional education by learning about the techniques used in professional practice including image formation evaluation and image interpretation.

**Majors**
There are two majors in the Bachelor of Applied Science - Medical Radiation Technology. Students choose either Radiotherapy Technology or Medical Imaging Technology.

**Further Information**
For Further information on the course, please contact the following:

**Medical Imaging Technology Coordinator**
Mrs Debbie Starkey
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Email: d.starkey@qut.edu.au

**Course Coordinator**
Associate Professor Pam Rowntree
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Email: p.rowntree@qut.edu.au

Course structure for students who commenced in 2009 and 2010

**Year 1, Semester 2**
- LSB245 Anatomy 2 and Introductory Pathology
- PCB276 General Radiography 1
- PCB277 Radiographic Practice
- PCB675 Radiation Safety and Biology

**Year 2, Semester 1**
- LSB321 Systematic Pathology
- LSB345 Regional & Imaging Anatomy 1
- PCB375-1 Radiographic Equipment
- PCB377 General Radiography 2
- PCB379 Clinical Radiography 1

**Year 2, Semester 2**
- LSB445 Regional and Imaging Anatomy 2
- PCB375-2 Radiographic Equipment
- PCB476 Special Procedures
- PCB477 Complementary Imaging Techniques
- PCB479 Clinical Radiography 2

**Year 3, Semester 1**
- PCB567 Advanced Radiographic Technique 1
- PCB581-1 Clinical Radiography 3
- PCB593 Digital Image Processing
- PCB672-1 Project
- PCB681 Computed Tomography Imaging

**Year 3, Semester 2**
- PCB581-2 Clinical Radiography 3
- PCB667 Advanced Radiographic Technique 2
- PCB672-2 Project
- PCB682 Magnetic Resonance Imaging

Course structure for students who commenced prior to 2009

**Year 1, Semester 1**
- LSB145 Anatomy 1
- PCB007 Patient Care in Professional Practice
- PCB178 Principles of Medical Radiations
- PCB272 Radiation Physics

**Year 1, Semester 2**
- LSB245 Anatomy 2 and Introductory Pathology
- PCB272 Radiation Physics
### PCB276 General Radiography 1

### PCB277 Radiographic Practice

#### Year 2, Semester 1

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### LSB245 ANATOMY 2 AND INTRODUCTORY PATHOLOGY

As an extension of LSB145, this human anatomy unit introduces the anatomical terminology used in the description of the cardiovascular system, lymphatic system, respiratory system, digestive system, urinary system, endocrine system, reproductive system and the anatomy of the eye and ear. The relationship between structure and function is investigated within these systems. Furthermore an examination of the application of scientific methods to the study of the general principles of disease processes and the major diseases of organ systems is included as a secondary component to this unit.

**Prerequisites:** LSB145  
**Assumed knowledge:** MIT  
**Equivalents:** LSB131  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2

### LSB321 SYSTEMATIC PATHOLOGY

This unit includes the applications of general pathology to the study of diseases of the organ systems: cardiovascular, respiratory, alimentary, urogenital, nervous, musculoskeletal, endocrine, haematologic and skin.

**Prerequisites:** LSB145  
**Antirequisites:** LSB361, LSB367, LSB475  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

### LSB345 REGIONAL & IMAGING ANATOMY 1

This unit focuses on the regional anatomy of the head, neck, upper limb, lower limb and the anatomy of the structures of the above regions which are visualised by medical imaging modalities.

**Prerequisites:** LSB145 and LSB245  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

### LSB445 REGIONAL AND IMAGING ANATOMY 2

This unit focuses on the regional anatomy of the back, thorax, abdomen and pelvic regions and the anatomy of the structures of the above regions which are visualised by medical imaging modalities.

**Prerequisites:** LSB145 and LSB245  
**Assumed knowledge:** Systematic Anatomy (LSB145 and LSB245 content)  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2

### PCB007 PATIENT CARE IN PROFESSIONAL PRACTICE

This is an introductory subject emphasising the appropriate response to the health care needs of patients and the

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### Potential Careers:

Medical Imaging Technologist, Radiographer.
ethical, legal and clinical accountability of the medical radiation technologist for patient care. It includes resuscitation techniques, client-professional communication and interpersonal behaviour and skills.

**Equivalent:** PYB074  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2011 SEM-1

**PCB176 PRINCIPLES OF MEDICAL RADIATIONS**  
This unit provides an overview of the physical principles of the various medical imaging modalities and techniques. It includes an overview of techniques used in the diagnosis and treatment of cancer.

**Credit points:** 12  **Contact hours:** 5 per week  **Campus:** Gardens Point  **Teaching period:** 2011 SEM-1

**PCB272 RADIATION PHYSICS**  
This unit includes the following: atomic structure, radioactivity, interaction of x-rays with matter; Radiation dosimetry; thermal physics, temperature, heat, thermal expansion; electric and magnetic fields, motion of charged particles; X-rays - properties and nature; X-ray tube construction and design; diagnostic and therapy tubes; high voltage generation, transformers, rectifiers, linear accelerators; ratings of X-ray tube, tube failure.  
**Assumed knowledge:** Senior Maths B and Senior Physics are assumed knowledge.  
**Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2011 SEM-1

**PCB276 GENERAL RADIOGRAPHY 1**  
A full and detailed knowledge of positioning techniques for skeletal radiography is essential to the education of medical imaging technologists. This unit is designed to provide students knowledge of skeletal radiography, and imaging practices.

**Prerequisites:** LQB183 and PCB178 and PCB252 and PCB277. PCB252 and PCB277 can be enrolled in the same teaching period as PCB276  
**Assumed knowledge:** Students should enrol in LSB245 and PCB277 in the same semester if not already completed  
**Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2011 SEM-2

**PCB277 RADIOPRACTICAL PRACTICE**  
This unit is a program of practical sessions relating to radiography of the skeletal system allowing the development of skills in patient positioning and image production.

**Prerequisites:** PCB007, PCB178, and PCB276. PCB276 can be enrolled in the same teaching period  
**Assumed knowledge:** Students should enrol in PCB276 in the same semester if not already completed  
**Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2011 SEM-2

**PCB375 RADIOGRAPHIC EQUIPMENT**  
This unit is an introduction to computer hardware, binary numbers and the digital image. A study of the equipment used in computed radiography, digital fluoroscopy, PACS and teleradiology is included. (12 credit points achieved at completion of PCB375-1 and PCB375-2.)  
**Prerequisites:** PCB178  
**Credit points:** 6  **Contact hours:** 2 per week  **Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**PCB375 RADIOGRAPHIC EQUIPMENT**  
To extend the description, initiated in PCB272 Radiation Physics and PCB375-1 Radiographic Equipment, of x-ray generators and ancillary equipment and to introduce specialised x-ray equipment, digital imaging, image quality and quality control. The aims of the unit are to develop an understanding of how different types of x-ray imaging equipment, particularly digital imaging devices, work and to develop an understanding of how to assess the quality of the images produced by this equipment, and assess the quality of the equipment. (12 credit points achieved at completion of PCB375-1 and PCB375-2.)  
**Prerequisites:** PCB375-1  
**Credit points:** 6  **Contact hours:** 2 per week  **Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2

**PCB377 GENERAL RADIOGRAPHY 2**  
This unit is an extension of topics introduced in PCB276 and includes more techniques of skeletal radiography, ward and operating theatre radiography, and examinations using contrast media. A program of practical sessions in skeletal imaging is included.

**Prerequisites:** PCB276 and PCB277 and LSB245  
**Corequisites:** PCB379  
**Credit points:** 12  **Contact hours:** 5 per week  **Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**PCB379 CLINICAL RADIOGRAPHY 1**  
This unit offers clinical experiences in radiographic examinations introduced in PCB276 and PCB377. Experience is obtained in approved clinical departments.

**Prerequisites:** LSB245 and PCB277 and PCB276  
**Corequisites:** PCB377  
**Credit points:** 6  **Contact hours:** 160 over 4 weeks  **Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1 and 2011 SEM-2

**PCB476 SPECIAL PROCEDURES**  
This unit includes specialised techniques of radiography including the skull, macroradiography, obstetrics, gynaecology, CNS, paediatrics and geriatrics.

**Prerequisites:** PCB377, PCB379 and PCB479 (PCB479 can be enrolled in the same teaching period)  
**Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardena Point  **Teaching period:** 2011 SEM-2
Gardens Point  Teaching period: 2011 SEM-2

PCB477 COMPLEMENTARY IMAGING TECHNIQUES
Medical imaging technologists are required to utilise a number of imaging modalities to assist in the diagnosis of disease. Proper utilisation of equipment requires an understanding of the underlying physical principles. Knowledge of the clinical applications enables an appreciation of the overall medical imaging strategies available in a patient's clinical management. The aim of this unit is to provide an appreciation of the physical principles and the complementary nature of the clinical applications of ultrasound and nuclear medicine.
Prerequisites: PCB178  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 SEM-2

PCB479 CLINICAL RADIOGRAPHY 2
In the continued development of positioning skills, it is essential that students have the opportunity to assist and perform radiographic examinations in the clinical situation. This period of clinical experience will enable you to gain further experience in general routine radiographic examinations and bedside radiography as well as an introduction to operating theatre and accident and emergency procedures. The unit will also provide an opportunity for you to become familiar with the patient care activities undertaken by radiographers.
Prerequisites: PCB379 and PCB476 (PCB476 can be enrolled in the same teaching period)  Credit points: 12  Contact hours: 200 over 5 weeks  Campus: Gardens Point  Teaching period: 2011 SEM-2 and 2011 SUM

PCB567 ADVANCED RADIOGRAPHIC TECHNIQUE 1
This unit includes a study of the appearances of pathology on medical images with particular emphasis on the radiographic image. It also includes a course of lectures and practical exercises on image interpretation including technical and diagnostic quality and decision-making.
Prerequisites: PCB476 and PCB479  Credit points: 12  Contact hours: 5 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

PCB580 CLINICAL RADIOGRAPHY 3
This unit offers clinical experience in advanced radiographic techniques as introduced in PCB567, and general radiography. (12 credit points achieved at completion of PCB580-1 and PCB580-2.)
Prerequisites: PCB580-1  Credit points: 6  Contact hours: 200 over 5 weeks  Campus: Gardens Point  Teaching period: 2011 SEM-2 and 2011 SUM

PCB580 CLINICAL RADIOGRAPHY 3
This unit offers clinical experience in special radiographic procedures as introduced in PCB476, PCB567 and general radiography. (12 credit points achieved at completion of PCB580-1 and PCB580-2.)
Prerequisites: PCB479  Credit points: 6  Contact hours: 240 over 6 weeks  Campus: Gardens Point  Teaching period: 2011 SEM-2

PCB581 CLINICAL RADIOGRAPHY 3
This unit offers an opportunity to observe and assist in the performance of advanced imaging techniques and procedures is important to the education of medical imaging students. The periods of clinical experience in this full year unit will enable you to gain experience in advanced imaging procedures and modalities in addition to consolidating skills in general radiography and minor procedures.
Prerequisites: PCB479  Credit points: 12  Teaching period: 2011 SEM-1, 2011 SEM-2 and 2011 SUM

PCB581 CLINICAL RADIOGRAPHY 3
This unit offers an opportunity to observe and assist in the performance of advanced imaging techniques and procedures is important to the education of medical imaging students. The periods of clinical experience in this full year unit will enable you to gain experience in advanced imaging procedures and modalities in addition to consolidating skills in general radiography and minor procedures.
Prerequisites: PCB479  Credit points: 12  Teaching period: 2011 SEM-2 and 2011 SUM

PCB593 DIGITAL IMAGE PROCESSING
This unit provides students with a basic understanding of the computer techniques used in image processing and reconstruction. Specific areas of study include the following: the structure of a digital image; image display techniques; grey scale palettes and look-up tables; Fourier transform theory; convolution theory; image processing hardware; image processing techniques, eg analysis, enhancement and restoration; spatial filtering; Fourier space filtering; methods of image reconstruction; 3D volume and surface rendering; applications of image processing in medicine, astronomy and remote sensing, etc.
Prerequisites: PCB375-2 or PCB496 or PQB250  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

PCB667 ADVANCED RADIOGRAPHIC TECHNIQUE 2
A knowledge of the principles of operation and application of advanced techniques and their imaging appearances is a necessary requirement of medical imaging students. This unit will expand and extend the knowledge acquired in previous units to advanced imaging investigations and practical imaging sessions will allow maintenance of general radiography skills.
Prerequisites: PCB567 and PCB581-1  Credit points: 12
Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

PCB672 PROJECT
This is a supervised project involving either application of existing theoretical practical knowledge or a literature survey of a selected relevant topic. (12 credit points achieved at completion of PCB672-1 and PCB672-2). Introductory lectures in research methods and statistics are provided.

Prerequisites: PCB476 or PCB397-2  
Credit points: 6  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

PCB675 RADIATION SAFETY AND BIOLOGY
Medical radiations procedures are the principal cause of non background radiation exposure. It is therefore important that you understand potential hazards of exposure to ionising radiation and techniques of protection. An understanding of relevant codes of practice is also required. The aim of this unit is to provide you with a basic understanding of aspects of radiation biology and radiation safety relevant to your future employment as a Medical radiation technologist.

Prerequisites: PCB272  
Credit points: 12  
Contact hours: 5 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

PCB681 COMPUTED TOMOGRAPHY IMAGING
This unit covers both the technological and clinical aspects of X-ray computed tomography (CT). Clinical applications described include those for specific anatomical areas as well as advanced and interventional applications. The strengths and weaknesses of CT in relation to other imaging modalities are discussed.

Prerequisites: LSB345 and LSB445  
Credit points: 12  
Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

PCB682 MAGNETIC RESONANCE IMAGING
Magnetic Resonance Imaging is a specialised modality within the field of medical radiations. The applications of magnetic resonance imaging have a wide impact on differential diagnoses and subsequent radiographic examinations. This unit will provide you with an introduction to the operation and clinical applications of magnetic resonance imaging.

Prerequisites: LSB345 and LSB445  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2