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

Year offered: 2010
Admissions: Yes
CRICOS code: 037588F
Course duration (full-time): 3 Years
Domestic fees (indicative): 2010: CSP $3,240 (indicative) per semester
International Fees (indicative): 2010: $10,750 (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 sub-score 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.studentservices.qut.edu.au/apply/ug/info/knowledge.jsp
Total credit points: 288
Standard credit points per full-time semester: 48
Course coordinator: Associate Professor Pam Rowntree
Discipline coordinator: Debbie Starkey
Campus: Gardens Point

OP Guarantee
The OP Guarantee does not apply to this program.

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

Career Outcomes
After graduating from the Medical Imaging Technology major, you may be employed as a medical imaging technologist or diagnostic radiographer. The Radiotherapy Technology major allows you to work as a radiation therapist.

Professional Recognition
On graduation with the Medical Imaging major, students will be eligible for provisional accreditation by the Australian Institute of Radiography. On graduation with the Radiotherapy Technology major, you will be eligible for provisional accreditation by the Australian Institute of Radiography (AIR).

Course Requirements
Students in this course should satisfy criteria related to health status. Students must declare height, physical disabilities, treatment of nervous condition and/or drug/alcohol disorder, and a current immunisation status (specifically Hepatitis B) as part of the online enrolment process.

Why Choose this Course?
This course is designed in consultation with clinical staff from radiology and radiation oncology departments, so you'll gain advanced knowledge of new diagnostic techniques and equipment used in the workplace. QUT's well equipped X-ray laboratories allow you to graduate with experience using equipment and techniques similar to those used in industry. Clinical placements in hospitals and private practices provide an opportunity to use your skills in a real workplace.

Deferment
QUT allows current Year 12 school leavers to defer their undergraduate admission offer for one year, or for six months if offered mid-year admission, except in courses using specific admission requirements such as questionnaires, portfolios, auditions, prior study or work experience.

Non-year 12 students may also request to defer their QTAC offer on the basis of demonstrated special circumstances.

Find out more on deferment.

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

Course Coordinator
Radiotherapy Technology
Associate Professor Pam Rowntree
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Course Coordinator
Medical Imaging Technology
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Course structure for students who commenced in 2009 and will commence in 2010
### Course Structure

#### 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
- **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
- **PCB580-1**: Clinical Radiography 3
- **PCB593**: Digital Image Processing
- **PCB672-1**: Project
- **PCB681**: Computed Tomography Imaging

#### Year 3, Semester 2
- **PCB580-2**: Clinical Radiography 3
- **PCB667**: Advanced Radiographic Technique 2
- **PCB672-2**: Project
- **PCB675**: Radiation Safety and Biology
- **PCB682**: Magnetic Resonance Imaging

**Potential Careers:**
Medical Imaging Technologist, Radiographer.

**UNIT SYNOPSISES**
LSB145 ANATOMY 1
The aim of this unit is to understand and apply anatomical terminology to the description of cell structure, primary tissues, the muscular system, and the integumentary system, with a primary focus on detailed osteology and arthrology of the human body. The relationship between structure and function is investigated within these systems.

Equivalents: LSB131  Credit points: 12  Contact hours: 5 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

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 students should enrol in PCB276 in the same semester if not already completed. RT students should enrol in PCB287 in the same semester if not already completed.

Equivalents: LSB231  Credit points: 12  Contact hours: 5 per week  Campus: Gardens Point  Teaching period: 2010 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: LSB245  Antirequisites: LSB361, LSB367, LSB475  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 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: 2010 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: 2010 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 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.

Equivalents: PYB074  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

PCB178 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: 2010 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: 2010 SEM-1

PCB276 GENERAL RADIOGRAPHY 1
This unit includes a program of lectures relating to radiography of the skeletal system, from preparation of the room and patient through to assessment of the final image.

Prerequisites: LSB145, PCB178, LSB245 and PCB277. LSB245 and PCB277 can be enrolled in the same teaching period.

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: 2010 SEM-2

PCB277 RADIOPHORIC 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:** 2010 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:** 2010 SEM-1

**PCB375 RADIOGRAPHIC EQUIPMENT**

This unit includes a discussion of scattered radiation and methods of dealing with scattered radiation. Image quality and evaluation is described as well as specialist radiographic imaging equipment for mammography and tomography. (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:** 2010 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:** 2010 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  
**Credit points:** 6  
**Contact hours:** 160 over 4 weeks  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1 and 2010 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:** Gardens Point  
**Teaching period:** 2010 SEM-2

**PCB477 COMPLEMENTARY IMAGING TECHNIQUES**

This unit introduces the physical principles, equipment and applications of medical ultrasound and nuclear medicine imaging. It includes basic ultrasound scanning techniques and resultant imaging appearances for abdomen and pelvis, smart parts, musculoskeletal, and vascular applications.

**Prerequisites:** PCB178  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**PCB479 CLINICAL RADIOGRAPHY 2**

This unit includes clinical experience in approved departments in radiographic examinations discussed in PCB377 and PCB476.

**Prerequisites:** PCB379 and PCB476 (PCB476 can be enrolled in the same teaching period)  
**Credit points:** 6  
**Contact hours:** 200 over 5 weeks  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2 and 2010 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:** 2010 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.)

**Credit points:** 6  
**Contact hours:** 200 over 5 weeks  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2 and 2010 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.)

**Credit points:** 6  
**Contact hours:** 240 over 6 weeks  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**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 PGB250
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-1

PCB667 ADVANCED RADIOGRAPHIC TECHNIQUE 2
This unit is an extension of topics in advanced radiographic techniques and professional practice and includes a study of the principles and techniques used in advanced radiographic techniques including angiography, arthrography, sonography and sialography.
Prerequisites: PCB567 and PCB581-1
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 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: 2010 SEM-1

PCB682 MAGNETIC RESONANCE IMAGING
This unit includes the physical principles and clinical techniques used in magnetic resonance imaging. The clinical applications for specific anatomical areas and pathologies are discussed.
Prerequisites: LSB345 and LSB445
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 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