Bachelor of Applied Science - Medical Radiation Technology (Radiotherapy 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 ST31 Bachelor of Radiation Therapy
QTAC code: 418192
Past rank cut-off: 94 and a successful questionnaire (see Additional Entry Requirements)
Past OP cut-off: 4 and a successful questionnaire (see Additional Entry Requirements)
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
Campus: Gardens Point

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QUT is the only university in Queensland to offer a radiotherapy technology qualification. This course leads to employment as a radiation therapist, assisting cancer patients at the most difficult time in their lives.

Other Majors
See also the separate entry for the following major in this course: Bachelor of Applied Science - Medical Radiation Technology (Medical Imaging Technology).

Why Choose this Course?
QUT works closely with the health sector in an effort to ensure that the number of graduates is in line with demand. In recent years, more than 95 per cent of graduates gained full-time employment within four months of graduation.

This course is designed in consultation with clinical staff from radiation oncology departments, so you will gain advanced knowledge of new treatment techniques and equipment used in the workplace. QUT’s well equipped laboratories allow you to graduate with experience using treatment planning equipment and techniques similar to those used in industry. Close links with local oncology departments allow you to complete practical work and clinical placements using specialised, state-of-the-art radiotherapy equipment.

Career Outcomes
As a radiation therapist in a radiotherapy department of a major hospital or private institution, you may become a member of a team treating cancer patients and be responsible for planning and delivering prescribed radiation doses.

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

Additional Entry Requirements
Radiotherapy Technology applicants are required to lodge a questionnaire, available from addentry.qut.com, by no later than 1 December 2010 (questionnaire available late August).

Early Closing Date
Late QTAC applications and changes of preference for this program close on 27 November 2009.

Other Course Requirements
You will be required to undertake clinical experience in hospital departments and private practices during the course and, as a result, will have direct patient contact during your placement and may be exposed to blood and body fluids of patients. You must be vaccinated for Hepatitis B and must provide a post-vaccination 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 should satisfy criteria related to health status, including declaration of 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.

Blue Card: A current Blue Card authorised with QUT may be required prior to commencing the clinical placement components in this course. Please read the Blue Card information (http://bluecard.qut.com) and ensure that you allow adequate time for processing your application and...
issuing of the card in order to avoid clinical experience delays.

**Deferment**
QUT's deferment policy does not apply to this course.

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

**Course Coordinator**
Associate Professor Pam Rowntree
Phone: +61 7 3138 2346
Email: p.rowntree@qut.edu.au

**Course structure for students who commenced in 2009 and will commence in 2010**

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<thead>
<tr>
<th>Year 1, Semester 1</th>
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<tbody>
<tr>
<td>LSB145 Anatomy 1</td>
<td>PCB007 Patient Care in Professional Practice</td>
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<tr>
<td>PCB178 Principles of Medical Radiations</td>
<td>PCB272 Radiation Physics</td>
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<tbody>
<tr>
<td>LSB245 Anatomy 2 and Introductory Pathology</td>
<td>PCB286 Treatment Planning 1</td>
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<tr>
<td>PCB287 Megavoltage Therapy 1</td>
<td>PCB287 Radiation Safety and Biology</td>
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<tr>
<td>LSB321 Systematic Pathology</td>
<td>LSB345 Regional &amp; Imaging Anatomy 1</td>
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<tr>
<td>PCB389 Clinical Radiotherapy 1</td>
<td>PCB396 Radiotherapy Planning and Physics</td>
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<tr>
<td>PCB397-1 Megavoltage Therapy 2</td>
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<tr>
<td>LSB445 Regional and Imaging Anatomy 2</td>
<td>PCB397-2 Megavoltage Therapy 2</td>
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<tr>
<td>PCB489 Clinical Radiotherapy 2</td>
<td>PCB495 Computer Assisted Treatment Planning 1</td>
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<td>PCB496 Radiotherapy Equipment</td>
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<tbody>
<tr>
<td>PCB587 Specialised Radiotherapy Technique 1</td>
<td>PCB590-1 Clinical Radiotherapy 3</td>
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<td>PCB593 Digital Image Processing</td>
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<tr>
<td>PCB590-2 Clinical Radiotherapy 3</td>
<td>PCB672-1 Project</td>
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<tr>
<td>PCB687 Specialised Radiotherapy Technique 2</td>
<td>PCB695 Advanced Treatment Planning Topics</td>
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**Course structure for students who commenced prior to 2009**

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<td>LSB145 Anatomy 1</td>
<td>PCB007 Patient Care in Professional Practice</td>
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<td>PCB107 Physics and Quantitative Techniques</td>
<td>PCB178 Principles of Medical Radiations</td>
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UNIT SYNOPSES

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

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
PCB286 TREATMENT PLANNING 1
This unit is an introduction to the techniques of radiotherapy treatment planning including patient data acquisition and radiation dosimetry.
**Prerequisites**: PCB178 and LSB145  **Credit points**: 12
**Contact hours**: 6 per week  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-2

PCB287 MEGAVOLTAGE THERAPY 1
This unit introduces the basic techniques of radiotherapy treatment delivery including beam direction and beam defining devices. Practical work is completed in hospital departments.
**Prerequisites**: PCB007, and PCB178, and LSB145 and LSB245. LSB245 can be studied in the same teaching period.  **Assumed knowledge**: Students should enrol in LSB245 in the same semester if not already completed
**Credit points**: 12  **Contact hours**: 6 per week  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-2

PCB389 CLINICAL RADIOTHERAPY 1
This unit offers clinical experience in radiotherapy related to topics introduced in PCB287 and PCB286. The programs are carried out in approved clinical departments.
**Prerequisites**: PCB286 and PCB287 and LSB246  **Credit points**: 6  **Contact hours**: 200 over 5 weeks  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-1

PCB396 RADIOTHERAPY PLANNING AND PHYSICS
This unit is an extension of the study of treatment planning introduced in PCB286 to the planning of complex techniques of photon therapy and electron therapy.
**Credit points**: 12  **Contact hours**: 5 per week  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-1

PCB397 MEGAVOLTAGE THERAPY 2
This unit includes the principles and applications of megavoltage therapy including techniques for specific sites. Practical exercises are performed in clinical departments.
**Credit points**: 6  **Contact hours**: 5 per week  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-1

PCB397 MEGAVOLTAGE THERAPY 2
This unit includes the principles and applications of megavoltage therapy including techniques for specific sites. Practical exercises are performed in clinical departments.
**Prerequisites**: PCB397-1  **Credit points**: 6  **Contact hours**: 5 per week  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-2

PCB489 CLINICAL RADIOTHERAPY 2
This unit includes clinical experiences in approved departments in techniques of radiation therapy.
**Prerequisites**: PCB389 and PCB396  **Credit points**: 6  **Contact hours**: 200 over 5 weeks  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-2 and 2010 SUM

PCB495 COMPUTER ASSISTED TREATMENT PLANNING 1
This unit includes a study of planning hardware and software to include two-dimensional planning and the development of concepts to an advanced level of understanding of computer-assisted optimisation of isodose distributions.
**Prerequisites**: LSB345 and PCB396 and PCB397-2. PCB397-2 may be studied in the same teaching period
**Credit points**: 12  **Contact hours**: 4 per week  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-2

PCB496 RADIOTHERAPY EQUIPMENT
In this unit students will gain an understanding of the physics underlying the operation of a modern linear accelerator, the interaction of radiation with tissue, dose measurement and related quality assurance procedures.
**Prerequisites**: PCB178  **Credit points**: 12  **Contact hours**: 4 per week  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-2

PCB587 SPECIALISED RADIOTHERAPY TECHNIQUE 1
This course of lectures and practical exercises focuses on the specialised techniques of orthovoltage and superficial therapy. It also includes the study of radioactivity including methods of radiation detection, radioactive equilibrium and production of radioisotopes, the principles and application of brachytherapy.
**Credit points**: 12  **Contact hours**: 6 per week  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-1

PCB590 CLINICAL RADIOTHERAPY 3
This unit offers clinical experience in radiotherapy treatment and planning including specialised radiotherapy techniques as discussed in PCB587 and PCB595. (12 credit points achieved at completion of PCB590-1 and PCB590-2.)
**Prerequisites**: PCB489 and PCB587  **Credit points**: 6  **Contact hours**: 200 over 5 weeks  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-2 and 2010 SUM

PCB590 CLINICAL RADIOTHERAPY 3
This unit offers clinical experience in radiotherapy treatment and planning including specialised radiotherapy techniques as discussed in PCB587 and PCB595. (12 credit points achieved at completion of PCB590-1 and PCB590-2.)
**Credit points**: 6  **Contact hours**: 200 over 5 weeks  **Campus**: Gardens Point  **Teaching period**: 2010 SEM-2 and 2010 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:** 2010 SEM-1

**PCB595 COMPUTER ASSISTED TREATMENT PLANNING 2**
This unit includes the use of computers in the planning of non-standard and complex radiotherapy treatment including arc and rotation techniques, irregular field techniques and 3 dimensional plans. Use of 3D computer planning system is included.

**Credit points:** 12  
**Contact hours:** 6 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**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

**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.)

**Prerequisites:** PCB672-1  
**Credit points:** 6  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**PCB675 RADIATION SAFETY AND BIOLOGY**
This unit includes a study of the biological effects of ionising radiation and the philosophy and protocol in radiation protection.

**Prerequisites:** PCB272  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**PCB687 SPECIALISED RADIOThERAPY TECHNIQUE 2**
This unit includes a study of specialised radiotherapy techniques including techniques applicable to the child patient and patients with communicable disease, total body photon and electron therapy. It also covers the principles, strengths and stage of development of techniques that are integral or complementary to the modern radiotherapy treatment of cancer.

**Prerequisites:** PCB587 and PCB595  
**Credit points:** 12  
**Contact hours:** 6 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**PCB695 ADVANCED TREATMENT PLANNING TOPICS**
This unit is a study of the principles and techniques of medical imaging used in the detection of cancer including MRI, PET and SPECT. This study also covers future directions of three dimensional treatment planning, and IMRT.

**Prerequisites:** PCB595 and PCB587  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2