Bachelor of Radiation Therapy (ST31)

Year offered: 2011
Admissions: Yes
CRICOS code: 073449G
Course duration (full-time): 3 Years
Domestic Fees (indicative): 2011: CSP $3,375 (indicative) per semester
International Fees (indicative): 2011: $11,000 (indicative) per semester
Domestic Entry: February: Fixed Closing Date - 26 November 2010
International Entry: February: Students must have a background in Radiation Therapy
QTAC code: 418192
Past rank cut-off: 92 plus successful questionnaire. Please refer to Additional Entry Requirements.
Past OP cut-off: 5 plus successful questionnaire. Please refer to 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.qut.edu.au/assumed-knowledge
Total credit points: 288
Standard credit points per full-time semester: 48
Course coordinator: Pete Bridge
Campus: Gardens Point

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

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
This course is provisionally accredited by the Australian Institute of Radiography and undergoing review during 2011.

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.

International Student Entry
International students may be offered a place in Radiation Therapy on condition they have met the Clinical Placement requirement. Please refer to Course Coordinator for further information.

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 of this course. For more information visit Blue Card, 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 healthcare needs, professional communication techniques and ethical, legal and accountability issues. Introductory studies in medical radiation and radiotherapy techniques are complemented with practical sessions using equipment in clinical departments. You will learn a range of skills including patient data acquisition, radiation dosimetry and the basic techniques of treatment delivery including beam direction and beam defining devices.

Year 2
You will progress to further studies in anatomy and pathology as well as the planning of complex techniques like photon therapy, electron therapy, and megavoltage therapy, including techniques for specific sites. The use of computer software to assist with the optimisation of isodose distributions will be covered along with issues related to the interaction of radiation with tissue, dose measurement and related quality assurance procedures. You will undertake practical exercises in hospital clinical departments along with your first clinical placement period, allowing you to gain real experience in a working environment.

Year 3
You will continue to develop your skills through clinical placements in hospitals and practical classes using equipment in clinical settings. You will cover the techniques of medical imaging used in the detection of cancer, along with future directions of three dimensional treatment planning. You will progress to more complex and specialised techniques for child patients and patients with communicable disease, along with the latest developments and techniques complementary to the modern radiotherapy treatment of cancer. You will learn important information about the biological effects of ionising radiation and the philosophy and protocol in radiation protection and quality assurance.

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

Course Coordinator
Mr Pete Bridge
Phone: +61 7 3138 2273
Email: pete.bridge@qut.edu.au

Course structure - 2011

<table>
<thead>
<tr>
<th>Year 1, Semester 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSB145 Anatomy 1</td>
</tr>
<tr>
<td>PCB007 Patient Care in Professional Practice</td>
</tr>
<tr>
<td>PCB178 Principles of Medical Radiations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 1, Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB272 Radiation Physics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2, Semester 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSB245 Anatomy 2 and Introductory Pathology</td>
</tr>
<tr>
<td>PCB286 Treatment Planning 1</td>
</tr>
<tr>
<td>PCB287 Radiation Therapy 1</td>
</tr>
<tr>
<td>PCB675 Radiation Safety and Biology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2, Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSB321 Systematic Pathology</td>
</tr>
<tr>
<td>LSB345 Regional &amp; Imaging Anatomy 1</td>
</tr>
<tr>
<td>PCB389 Clinical Radiotherapy 1</td>
</tr>
<tr>
<td>PCB396 Treatment Planning 2</td>
</tr>
<tr>
<td>PCB397-1 Radiation Therapy 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3, Semester 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB587 Radiation Therapy 3</td>
</tr>
<tr>
<td>PCB591-1 Clinical Radiotherapy 3</td>
</tr>
<tr>
<td>PCB593 Digital Image Processing</td>
</tr>
<tr>
<td>PCB595 Treatment Planning 4</td>
</tr>
<tr>
<td>PCB672-1 Project</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3, Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB591-2 Clinical Radiotherapy 3</td>
</tr>
<tr>
<td>PCB672-2 Project</td>
</tr>
<tr>
<td>PCB687 Specialised Radiotherapy Technique</td>
</tr>
<tr>
<td>PCB695 Advanced Treatment Planning Topics</td>
</tr>
</tbody>
</table>

Potential Careers:
Radiation Therapist.

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: 2011 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: 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:** LSB245  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 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: 2011 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: 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

**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 LQB183 and PCB272  Credit points: 12  Contact hours: 6 per week  Campus: Gardens Point  Teaching period: 2011 SEM-2

**PCB287 RADIATION THERAPY 1**
This unit introduces the basic techniques of radiotherapy treatment and equipment. Practical sessions are completed in clinical departments.
**Prerequisites:** PCB007 and PCB178 and LQB183  Credit points: 12  Contact hours: 6 per week  Campus: Gardens Point  Teaching period: 2011 SEM-2

**PCB389 CLINICAL RADIOTherapy 1**
The development and demonstration of clinical skills promotes integration of theoretical understanding and practical skills. The student will gain skills and knowledge
which will enable them to carry out the basic skills of a radiation therapist under supervision.

**Prerequisites:** PCB286 and PCB287 and LSB245  
**Credit points:** 6  
**Contact hours:** 200 over 5 weeks  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1 and 2011 SEM-2

**PCB396 TREATMENT PLANNING 2**
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.  
**Prerequisites:** PCB286 and PCB287 and LSB245 and PCB272  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**PCB397 RADIATION THERAPY 2**
Oncology and technique are an essential component of radiation therapy skills and application of fundamental principles to routine treatment practice is essential. Students will need to gain practical skills in order to become a competent radiation therapist and this module provides them with the underpinning theory and practice. Students at this level are expected to engage with the literature base in order to support their work and they will have specific support for this via the presentation.  
**Prerequisites:** PCB286 and PCB287 and LSB246  
**Credit points:** 6  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**PCB397 RADIATION 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:** 2011 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:** 2011 SEM-2 and 2011 SUM

**PCB495 TREATMENT PLANNING 3**
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:** LQB389 and PCB396  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2

**PCB496 RADIOTHERAPY EQUIPMENT**
It is important for you as a future radiation therapist to understand the principles of operation of radiotherapy equipment and the basic physics of the interaction of radiation with tissue. The aim of this unit is to teach you about the physics underlying the operation of linear accelerators and associated topics such as the interaction of radiation with tissue and the measurement of radiation dose.  
**Prerequisites:** PCB178  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2

**PCB587 RADIATION THERAPY 3**
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.  
**Prerequisites:** PCB397, PCB489, PCB495 and LSB445  
**Credit points:** 12  
**Contact hours:** 6 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**PCB591 CLINICAL RADIOTHERAPY 3**
**Prerequisites:** (PCB590-1 or PCB591-1) and PCB587 and PCB595  
**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

**PCB595 TREATMENT PLANNING 4**
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.

**Prerequisites:** PCB397-2 and PCB489 and LSB445 and PCB495  
**Credit points:** 12  
**Contact hours:** 6 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 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:** 2011 SEM-1

**PCB672 PROJECT**

The purpose of this unit is to enable you to carry out an independent enquiry within a professionally related area. An introduction to the research process is important preparation for future professional studies. This full year unit will assist you to develop skills in research and reporting writing as independent learners. During semester two you will prepare a report and poster on a chosen topic. (12 credit points achieved at completion of PCB672-1 and PCB672-2.)

**Prerequisites:** PCB672-1  
**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

**PCB687 SPECIALISED RADIOTHERAPY TECHNIQUE**

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:** 2011 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:** 2011 SEM-2