

**Department of Radiation Therapy  
University of Otago, Wellington**



**BACHELOR  
OF  
RADIATION THERAPY  
  
(BRT)  
  
CURRICULUM DOCUMENT**

**February 2014**



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### **PAPER DESCRIPTORS**

#### **Stage I:**

RADT 111 Anatomy & Imaging	23
RADT 112 Cancer Cell Biology	26
RADT 113 Health & Human Behaviour	28
RADT 114 Healthcare Communication	32
RADT 115 Radiation Technology I	35
RADT 116 Radiation Therapy and Oncology I	38
RADT 117 Radiation Therapy Planning Concepts I	41

#### **Stage II**

RADT 211 Radiation Therapy Practice II	45
RADT 212 Principles of Research	48
RADT 213 Advanced Healthcare Communication	50
RADT 214 Radiation Technology II	53
RADT 215 Radiation Therapy and Oncology II	56
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### **Stage III**

RADT 311 Radiation Therapy Practice III	63
RADT 312 Literature Analysis	66
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Appendix A - Moderators

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Appendix D - NZQA Approval

CUAP Approval

# 1. Aims of the Programme

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## 1.1 General Aims

The Bachelor of Radiation Therapy (BRT) aims to produce graduates with the following attributes:

- 1.1.1 clinical competence in radiation therapy, demonstrating safe and professional practice.
- 1.1.2 a sound understanding of the theoretical basis for clinical practice.
- 1.1.3 excellent interpersonal skills in the demonstration of empathy and sensitivity to all patients.
- 1.1.4 excellent communication skills, both oral and written in communicating with colleagues and the health care team.
- 1.1.5 the ability to act independently when professionally appropriate as well as co-operatively with colleagues and other health care team members.
- 1.1.6 sound analytical skills to enable flexible and creative responses to the changes and challenges presented by clinical practice.
- 1.1.7 the skills of the “reflective practitioner” in being willing and able to review their own clinical competence and be responsive to the need for personal and professional change.
- 1.1.8 the ability to apply the principles of research as a foundation for on-going personal and professional development.
- 1.1.9 an awareness of the importance of the Treaty of Waitangi to the delivery of health care in New Zealand.

Cognitive skills will be progressively enhanced throughout the learning activities that will develop both an academic foundation and technical skill. The student will deal with problems of increasing complexity, recognising increasing contextual dimensions and the recognition of a range of possible solutions. This will involve increasingly proficient and perceptive interpersonal skills.

## 2. Occupational Conditions

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During the programme, students must undertake approved work experience hours.

- The Work Experience hours complement the formal academic clinical components of the Bachelor of Radiation Therapy ie Stage I Clinical Placements, Radiation Therapy Practice II and Radiation Therapy Practice III, and fully prepares students for clinical practice upon qualifying.
- Work Experience hours must be completed as per the Bachelor of Radiation Therapy academic calendar.
- Students will have completed approximately 2200 clinical hours (clinical studies plus work experience) at the completion of the degree.

### 3. Programme Development

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#### Relocation to the University of Otago

With the dis-establishment of Central Institute of Technology (CIT) in June 2001, the Bachelor of Health Science (Radiation Therapy) relocated to the University of Otago's Wellington School of Medicine and Health Science. The programme was renamed the Bachelor of Health Sciences (Medical Radiation Therapy). Effective 1<sup>st</sup> January 2011 the programme was then renamed the Bachelor of Radiation Therapy to clarify the focus of this vocational programme, and to raise the profile within the University of Otago.

The radiation therapy profession and the University of Otago have taken the opportunity to develop the programmes in a university environment. This gives opportunities for study and research at undergraduate and postgraduate levels in an internationally recognized university focused on health sciences.

#### Background

The Bachelor of Health Science (Radiation Therapy) programme was a development of the National Diploma in Medical Radiation Therapy – which developed from the CIT's Diploma in Therapeutic Radiography.

The radiation therapy profession had, for a number of years, considered that a degree level qualification should be available in New Zealand. In 1990 a survey of the profession was conducted in which 81% of the respondents favoured a degree as the standard qualification. The British profession had a degree in radiation therapy for many years as had Australia. The USA moved in this direction also. Canada had announced a requirement for a degree level qualification as a pre-requisite for registration by the year 2005. For New Zealand graduates to maintain parity with their overseas counterparts they required a bachelor's level degree. Between 50-75% of New Zealand graduates in radiation therapy gain overseas experience in Australia and the United Kingdom.

A degree in Diagnostic Imaging was developed by Unitec and commenced in 1995. Manawatu Polytechnic (now UCOL) offer the Bachelor in Applied Science (Medical Imaging Technology), which commenced in 1996. A degree was also developed and implemented by CPIT (Christchurch Polytechnic Institute of Technology) in 1998. For radiation therapy, the implementation of the Bachelor of Health Science (Radiation Therapy) at CIT (Central Institute of Technology) allowed radiation therapists to maintain parity with their professional colleagues in New Zealand.

The therapy degree was developed in consultation with the radiation therapy profession. A sub-committee of the Radiation Therapy Advisory Committee was formed which had the major responsibility for both the structure and content of the degree programme.

In 2005 a University of Otago led Curriculum Review commenced and the revised curriculum was implemented from 2009 onwards. This curriculum has been developed after extensive consultation with the profession, university, stakeholders and external reviewers.

## 4. Programme Description

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The curriculum is designed so that papers are taught as part of an integrated and coherent structure, with a consistent overall process of learning and problem solving and a series of vertical and horizontal learning areas or strands.

### 4.1 The Three Stage Programme

The Bachelor of Radiation Therapy comprises three stages. Generally each stage will be completed in one year's full time study.

A new curriculum has been implemented, commencing with Stage I in 2009, Stage II in 2010 and Stage III in 2011.

**All papers are compulsory**

### 4.2 Stage I

Stage I consists of the following papers:

Paper Title	Points
RADT 111 Anatomy & Imaging	30
RADT 112 Cancer Cell Biology	10
RADT 113 Health & Human Behaviour	9
RADT 114 Healthcare Communication	9
RADT 115 Radiation Technology I	18
RADT 116 Radiation Therapy and Oncology I	30
RADT 117 Radiation Therapy Planning Concepts I	14

*1 point is equivalent to 12.5 hours of student learning*

### 4.3 Stage II

Stage II consists of the following papers:

Paper Title	Prerequisite	Points
RADT 211 Radiation Therapy Practice II	All stage I papers	60
RADT 212 Principles of Research	All stage I papers	6
RADT 213 Advanced Healthcare Communication	RADT 113 and 114	10
RADT 214 Radiation Technology II	RADT 115	16
RADT 215 Radiation Therapy and Oncology II	RADT 116	10
RADT 216 Radiation Therapy Planning Concepts II	RADT 116 and 117	18

*1 point is equivalent to 12.5 hours of student learning*

### 4.4 Stage III

Stage III consists of the following papers:

Paper Title	Prerequisite	Points
RADT 311 Radiation Therapy Practice III	RADT 312, 313, 314, 315	60
RADT 312 Literature Analysis	RADT 212	20
RADT 313 Professional Development	RADT 213	10
RADT 314 Radiation Therapy and Oncology III	RADT 215	12
RADT 315 Radiation Therapy Planning Concepts III	RADT 215 and 216	18

*1 point is equivalent to 12.5 hours of student learning*



#### **4.5 Integration of a Process Curriculum**

Vertical and horizontal integration of the programme is important to enable students to develop increasingly complex cognitive, affective and psychomotor skills. This integration has been achieved by the overall programme design which links paper content and learning outcomes within and across stages.

Integration will also be achieved by the extensive use of case studies, projects, problem solving exercises, seminars and through clinical situations. Sequencing will guide the student to obtain sufficient background information and level of skill to deal with progressively more complex material and situations.

Integration will require good communication among lecturers. To this end the Head of Department is responsible for regular and frequent communication between members of the teaching team.

#### **4.6 Learning, Interacting and Self-Management**

The way in which the student learns and interacts with others (staff, students, patients and other professionals) throughout the programme is considered to be the key to the achievement of the aims concerning personal growth. Students will be encouraged, from the outset, to develop the skills of an independent learner and to reflect upon their learning. The ability to self-assess is an integral part of the programme's objectives.

It is essential to facilitate the early adaptation of students to expectations regarding their role in the learning process and their ability to interact with others.

Exercises in independent learning and critical thinking are introduced at the start of the programme. Developing effective verbal and written communication skills is an important aim throughout the programme. There are papers which specifically address these areas, such as the Behavioural Science papers. However, there is also a formal expectation of early application of the principles in all courses in the first stage and beyond.

In all papers, students will be required to investigate topic areas to a greater depth than that provided during class contact hours. To this end, formal class contact will usually be no more than 20 hours per week.

#### **4.7 Accessing a Specific Academic Base Biological Sciences**

Students will develop the ability to understand the basic systems of the human body and how these interact.

This is delivered through the anatomy and cancer cell biology papers. The imaging of anatomy is introduced at the beginning of Stage I and forms a foundation for the *Radiation Therapy & Oncology* and *Radiation Therapy Planning Concepts* papers.

#### **4.8 Behavioural Science**

Students need to have access to knowledge from behavioural science and healthcare communication to enable them to perform as competent professionals in the field of radiation therapy.

This knowledge is essential to enable graduates to understand the context of illness and work with clients, colleagues and others they may interact with while performing as a professional in the field. These skills will be integrated into the *Radiation Therapy Practice* and *Healthcare Communication* papers as well as the *Health and Human Behaviour* components.

#### **4.9 Physics and Allied Sciences**

Since most radiation treatment is provided using advanced technology students require a sound knowledge of physics as well as sufficient understanding of radiation technology to enable them to perform in a professional manner. Specialist lecturers will be employed to ensure that the latest information is presented to students. The papers relevant to this area are the *Radiation Technology I & II*.

#### **4.10 Radiation Therapy Practice**

This section of the curriculum, which includes the Stage I clinical placements, the Stage II *Radiation Therapy Practice* and Stage III *Radiation Therapy Practice* papers, is designed to prepare the student for practice in a modern clinical setting. The clinical practice papers are designed to integrate the students' learning to a point where practical skills and theoretical understanding merge. Students have the opportunity to develop their clinical skills under supervision in well equipped radiation oncology departments in Auckland, Auckland Private, Waikato, Palmerston North, Wellington, Christchurch, Christchurch Private and Dunedin.

#### **4.11 Research**

As professionals in the field of radiation therapy graduates must be able to critically analyse research published by others. To this end students will study the principles of good research methodologies. While these principles are covered in the *Principles of Research* and *Literature Analysis* papers the concepts will be carried through all the subjects of the final stages of the programme.

## 5. Timing of the Programme

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### 5.1 Duration of the Course

The Bachelor of Radiation Therapy is a three year full time programme.

### 5.2 Composition of Each Stage

#### 5.2.1 Stage I

31 weeks attending classes at the Department of Radiation Therapy, University of Otago, Wellington.

2 weeks clinical placement with a clinical provider.

#### 5.2.2 Stage II

1 semester Radiation Therapy Practice with a clinical provider.

1 semester attending classes at the Department of Radiation Therapy, University of Otago, Wellington.

#### 5.2.3 Stage III

1 semester attending classes at the Department of Radiation Therapy, University of Otago, Wellington.

1 semester Clinical Studies with a clinical provider.

## 6. Structure of the Programme

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The programme consists of 4500 notional hours of student learning divided into three stages.

### 6.1 Stage I

RADT 111	Anatomy & Imaging
RADT 112	Cancer Cell Biology
RADT 113	Health & Human Behaviour
RADT 114	Healthcare Communication
RADT 115	Radiation Technology I
RADT 116	Radiation Therapy and Oncology I
RADT 117	Radiation Therapy Planning Concepts I

### 6.2 Stage II

RADT 211	Radiation Therapy Practice II
RADT 212	Principles of Research
RADT 213	Advanced Healthcare Communications
RADT 214	Radiation Technology II
RADT 215	Radiation Therapy and Oncology II
RADT 216	Radiation Therapy Planning Concepts II

### 6.3 Stage III

RADT 311	Radiation Therapy Practice III
RADT 312	Literature Analysis
RADT 313	Professional Development
RADT 314	Radiation Therapy and Oncology III
RADT 315	Radiation Therapy Planning Concepts III

## 7. Assessment

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### 7.1 Assessment Philosophy

*All assessment tasks will allow students to demonstrate their achievement of the learning outcomes being assessed.*

This philosophy will be implemented by the use of the following strategies:

- All assessment tasks will be appropriate for the level and nature of the learning outcomes being assessed.
- Each assessment task will be clearly stated.
- Dates for assessments will be advised to students in advance. The dates for all summative assessments will be published at the beginning of each semester.
- Self and peer assessment will be encouraged and used whenever appropriate.
- Formative assessments will be carried out to identify difficulties students may be encountering, and to provide frequent feedback on learning progress.
- When it is appropriate for students work to be returned after marking, it will be returned as soon as practical.

### 7.2 Assessment Pattern

Students must have a current approved comprehensive first aid certificate before taking a final clinical or written assessment. This is relevant for Stage I, II and III.

#### **RADT 111: Anatomy & Imaging**

Summative assessment will consist of the following:

- one test = 15% of total mark
- one test = 15% of total mark
- one test = 15% of total mark
- one test = 15% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to sit the final examination.

A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

#### **RADT 112: Cancer Cell Biology**

Summative assessment will consist of the following:

- one test = 30% of total mark
- one test = 30% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to take the final examination.

A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

### **RADT 113: Health & Human Behaviour**

Summative assessment will consist of the following :

- one assignment = 25% of total mark
- one assignment = 35% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to sit the final examination.

A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

### **RADT 114: Health Care Communication**

Summative assessment will consist of the following:

- one assignment = 50% of total mark
- one observational analysis = 50% of total mark

A pass will be awarded to all students who gain 50% overall in the coursework.

### **RADT 115: Radiation Technology I**

Summative assessment will consist of the following :

- one test = 20% of total mark
- one test = 20% of total mark
- one test = 20% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework and the computer assignment must be successfully completed to be eligible to take the final examination.

A pass will be awarded to all students who gain a minimum of 50% in the examination and 50% overall.

### **RADT 116: Radiation Therapy and Oncology I**

Summative assessment will consist of the following :

- one test = 20% of total mark
- one test = 20% of total mark
- one assignment = 20% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework and the clinical assignment must be successfully completed to be eligible to take the final examination.

A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

### **RADT 117: Radiation Therapy Planning Concepts I**

Summative assessment will consist of the following:

- one test = 40% of total mark
- one assignment = 30% of total mark
- one viva = 30% of total mark

A pass will be awarded to all students who gain 50% minimum overall.

### **RADT 211: Radiation Therapy Practice II**

Summative assessment will consist of all outcomes within each of the three domains:

- one rotational assessment (CT/sim) = Pass/Fail
- one rotational assessment (planning) = Pass/Fail
- one rotational assessment (treatment) = Pass/Fail

And

- one clinical journal = Pass/Fail

A pass will be awarded to all students who gain a pass in each component. Students will need to gain 640 clinical hours for the semester in which they have enrolled.

#### **Reassessment:**

- Reassessment can occur in two domains for each enrolment of the paper.
- If a student fails all three domains they are not eligible for reassessment and fail the paper overall.
- Reassessment can occur for the clinical journal.

### **RADT 212: Principles of Research**

Summative assessment will consist of the following:

- one assignment (quantitative) = 50% of total mark
- one assignment (qualitative) = 50% of total mark

A pass will be awarded to all students who gain 50% overall.

### **RADT 213: Advanced Healthcare Communication**

Summative assessment will consist of the following :

- one case study = 40% of total mark
- one assignment = 30% of total mark
- one assignment = 30% of total mark

A pass will be awarded to all students who gain 50% overall.

### **RADT 214: Radiation Technology II**

Summative assessment will consist of the following :

- one assignment = 20% of total mark
- one test = 20% of total mark
- one test = 20% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to take the final examination.

A pass will be awarded to all students who gain a minimum of 50% in the examination and 50% overall.



### **RADT 215: Radiation Therapy and Oncology II**

Summative assessment will consist of the following :

- one group presentation = 30% of total mark
- one test = 30% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to take the final examination.

A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

### **RADT 216: Radiation Therapy Planning Concepts**

Summative assessment will consist of the following:

- one assignment (dosim/calcs/imaging) = 40%
- one test (radiobiology) = 20%
- one VIVA (60% pass mark) = 40%

One reassessment can occur if the pass mark of 60% is not achieved in the dosimetry viva.

A pass will be awarded to all students who gain 50% minimum overall.

### **RADT 311: Radiation Therapy Practice III**

Summative assessment will consist of all outcomes within each domain:

- assessment (CT/sim) = Pass/Fail
- assessment (planning) = Pass/Fail
- assessment (treatment) = Pass/Fail

A pass will be awarded to all students who gain a pass in each domain.

#### **Reassessment:**

- Reassessment can occur in two domains for each enrolment of the paper.
- If a student fails all three domains they are not eligible for reassessment and fail the paper overall.

### **RADT 312: Literature Analysis**

Summative assessment will consist of the following:

- quantitative assignment 40%
- qualitative assignment 40%
- poster discussion 20%

A pass will be awarded to all students who gain 50% overall.

### **RADT 313: Professional Development**

Summative assessment will consist of the following :

- one assignment (ethics) = 50% of total mark
- one assignment (professional issues) = 50% of total mark

A pass will be awarded to all students who gain 50% overall.

### **RADT 314: Radiation Therapy and Oncology III**

Summative assessment will consist of the following :

- one test = 30% of total mark
- one assignment = 30% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to take the final examination.

A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

### **RADT 315: Radiation Therapy Planning Concepts III**

Summative assessment will consist of the following:

- one test (calculations) = 30%
- one radiobiology test = 20%
- one dosimetry viva (67% pass mark) = 50%

One reassessment can occur if the pass mark of 67% is not achieved in the dosimetry viva.

A pass will be awarded to all students who gain 50% overall.

## **7.3 Assessment Standards**

The overall standards are laid out in the *Aims of the Programme* as the attributes of the graduate of the programme. (See 1. Aims of the Programme, p.1).

These aims have been developed in close association with the profession through the Curriculum Review Committee and the Radiation Therapy Board of Studies and Examinations.

## **7.4 Moderators**

Internal moderation occurs for each paper within the Department of Radiation Therapy. One external moderator is appointed from the profession to moderate radiation therapy focussed written examinations. External specialist lecturers moderate other papers, eg. Cancer Cell Biology. A clinical radiation therapist moderates a sampling of clinical journals.

## **7.5 Monitor**

Academic monitoring occurs from the School of Medical Radiation Science, University of Sydney.

The Medical Radiation Technologists Board monitors the Bachelor of Radiation Therapy in accordance with guidelines, under the Health Practitioners Competence Assurance Act, 2003.

## **8. Procedures for Changes to the Programme**

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There are three levels of change in the programme which can take place:

### **8.1 Minimal Changes**

Small alterations to the programme will be implemented within the Department of Radiation Therapy.

### **8.2 Minor Changes**

Where the changes are more significant, but do not involve the structure of the programme they will be referred on to the Radiation Therapy Board of Studies and Examinations. Minutes from these minutes refer issues to the Health Sciences Divisional Board.

### **8.3 Major Changes**

Any change to the overall structure will be referred to CUAP for approval following approval by the University of Otago Senate.

## **9. Management of the Programme**

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### **9.1 Programme Co-ordination**

The Director and Head of Department has responsibility for the overall co-ordination of the programme.

### **9.2 Paper Convenors**

Paper Convenors are responsible for the efficient co-ordination and delivery of papers. The internal moderators work with the paper convenors on content and assessment.

### **9.3 Year Leaders**

Year Leaders have an overall responsibility for the students in a particular stage of the course. Responsibilities include pastoral care, staff/student meetings and facilitating the Professional Attitudes process.

## 10. Relationship to Other Programmes

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### 10.1 Overseas Undergraduate Qualifications

A number of New Zealand radiation therapists have gained degree level qualifications in radiation therapy. The most popular programmes were the BHSc – Conversion Programme from the Central Institute of Technology and the BSc (Radiography) Conversion Programme from the Anglia Polytechnic University in England. These programmes and others such as the BSc(Hons) Radiotherapy from Southbank University, London, require students to attain high levels of competency, the skills of the reflective practitioner and the skills of critical analysis in relation to research. The outcomes of these qualifications are similar to those of the Bachelor of Radiation Therapy programme.

New Zealand graduates of the Bachelor of Radiation Therapy (or equivalent) are eligible to apply to work in several countries including the United Kingdom, Ireland, Canada, Australia (after one year) and many Arab states.

### 10.2 New Zealand Postgraduate Qualifications

There are a number of postgraduate qualifications available to the graduates from the Bachelor of Radiation Therapy.

The University of Otago offers the Bachelor of Radiation Therapy (Honours), the Postgraduate Certificate in Health Sciences endorsed in Radiation Therapy Advanced Practice and also postgraduate certificates, diplomas, masters and PhD programmes.

## 11. Programme Regulations

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### 11.1 Entry Requirements

The Radiation Therapy Admissions Committee shall consider applications from candidates in the following categories:

- Admission with secondary school qualification
- Admission with one year of tertiary study
- Admission with two or more years of tertiary study
- Admission with tertiary qualification(s)
- Admission with alternative qualifications and/or experience

International students are not eligible to apply for the Bachelor of Radiation Therapy.

#### Main Categories

- ***To gain admission from secondary school, a candidate will:***
  - Have fulfilled the University's entrance requirements, **and**
  - Have attained a satisfactory standard determined by the Radiation Therapy Admissions Committee in NCEA Level 2 (or equivalent), **and**
  - Have completed or be completing to a satisfactory standard determined by the Radiation Therapy Admissions Committee, English/English-rich subject and/or Te Reo Maori or Te Reo Rangatira, Mathematics with Statistics or Calculus and Physics or Biology at NCEA Level 3 (or equivalent)

English-rich subjects at Level 3 are: English, Classics, Geography, History, Art History

Applicants are initially reviewed based on their Level 2 (or equivalent) performance and subjects taken for NCEA Level 3 (or equivalent).

Applicants must have completed NCEA Level 3 (or equivalent) within the last five years.

Final entry is subject to NCEA Level 3 results (or equivalent).

- ***To gain admission with one year of tertiary study, a candidate will:***
  - Have undertaken one year of relevant university study, **and**
  - Have completed relevant papers to a standard determined annually by the Radiation Therapy Admissions Committee
- ***To gain admission with two or more years of tertiary study, a candidate will:***
  - Have undertaken two or more years of relevant university study, **and**
  - Have completed their papers to a standard determined annually by the Radiation Therapy Admissions Committee
- ***To gain admission with a tertiary qualification, a candidate will:***
  - Have completed the requirements of a relevant university degree to a standard determined annually by the Radiation Therapy Admissions Committee

- **To gain admission with alternative qualifications and/or experience, a candidate will:**
  - Possess not less than five years of experience in a health-related profession, of which at least two years must have been in New Zealand, **and/or**
  - Demonstrate academic ability acceptable to the Radiation Therapy Admissions Committee, **and**
  - Satisfy any other criteria set by the Radiation Therapy Admissions Committee

### **Sub-categories**

The University of Otago is committed to initiatives that increase the number of indigenous Maori and indigenous Pacific Island graduates. The Division of Health Sciences is focused on ensuring that New Zealand's diverse health workforce needs are met, to honouring the principles of the Treaty of Waitangi/Tiriti o Waitangi and promoting academic equity for under-represented groups.

Applicants may also be considered in one or both of the following sub-categories:

1. Indigenous Maori
2. Indigenous Pacific

### **Demonstration of suitability to the profession by interview**

Selection for interview is based on: academic performance, department visit and handwritten statement to a standard determined by the Radiation Therapy Board of Studies.

For a student whose application for admission is based on qualifications gained outside New Zealand and whose first language is not English or Maori, evidence of such competence and understanding to be supplied shall be in the form of certified results in:

- the International English Language Test (IELT) with a score of not less than 7.5 in the academic band, with a score of 8 or better in the listening band and 8 or better in the speaking band. This test is to be taken in New Zealand.
- In general students will have clinical placements with Clinical Providers which operate an oncology unit. This is to ensure that there is adequate access to an appropriate clinical environment. An exception to this may be made provided the applicant can provide evidence that she or he can obtain the required clinical experience and tuition.
- Students are required to hold a current comprehensive first aid certificate on entry to the programme. This certificate is to be maintained throughout the duration of the programme.

Note: Student numbers will be limited to the availability of clinical placements.

## **11.2 Admission to the Course**

- (a) Admission to the course for the degree of Bachelor of Radiation Therapy shall be determined by the Pro Vice-Chancellor (Health Sciences) on the advice of the Radiation Therapy Admissions Committee.
- (b) The number of candidates to be admitted to the first year of the course will be determined by the number of places available for clinical education.
- (c) Candidates will be selected by the Radiation Therapy Admissions Committee on the basis of their academic record and their interview.

Note: Applications for admission to first year classes must reach the Division of Health Sciences not later than 15<sup>th</sup> September in the year preceding desired entry.

## **11.3 Completion of the Programme**

- (a) The programme consists of three stages. Generally students must succeed at each stage to progress to the next stage.
- (b) The structure of the programme makes it unlikely that a student would be able to complete a trailing subject and continue with the following stage of the programme.
- (c) Students will be expected to complete the programme in five years or less. Students will need a clinical placement before re-enrolling in a clinical paper.
- (d) Every course of study for the degree shall normally be followed for not less than three years of full-time study.

## **11.4 Assessments**

- (a) Students will be given a range of formative assessments throughout the year as a basis for determining progress.
- (b) Students must complete all coursework requirements, which includes formative and summative assessments.
- (c) Extensions to coursework assessments may be granted by Paper Convenors in consultation with the Year Leader (evidence may need to be provided).

### **If coursework assessments are late:**

- form to be completed (based on exam special consideration form)
- provide evidence if possible to support late submission
- this is considered by the Paper Convenor in consultation with the Year Leader.



### **Outcomes:**

- reason for late submission is accepted
  - reason for late submission is not accepted and a penalty to the assessment mark may be applied.
- HOD to be informed of situations as appropriate.

- (d) In the case of illness at the time of a test, the student must contact Reception on Ph: 385 5475 **PRIOR** to the start of a test. A medical certificate must be presented (dated the day of the test) to the Head of Department before an alternative test will be arranged. Failure to observe this procedure may result in the student being refused an opportunity to sit the test, and therefore receive a score of zero for it.
- (e) Students who are refused terms will normally be required to repeat the paper as a whole, subject to approval by the Radiation Therapy Board of Studies and Examinations.

### Submission of Previously Assessed Work

- (f) Any student who attempts to pass off their own work, either in part or whole, which has previously been assessed in the same or another paper, **as original work** will receive no assessment result for that work, nor will they have an opportunity to resubmit the work for that assessment. In addition, the student may be subject to disciplinary action.

### Plagiarism

- (g) Students should make sure that all submitted work is their own. Plagiarism is a form of dishonest practice. Plagiarism (including being party to someone else's plagiarism) is defined as copying or paraphrasing another's work, whether intentionally or otherwise, and presenting it as one's own.

In practice this means plagiarism includes any attempt in any piece of submitted work (e.g. an assignment or test) to present as one's own work the work of another (whether of another student or a published authority).

Any student found responsible for plagiarism in any piece of work submitted for assessment shall be subject to the University's dishonest practice regulations which may result in various penalties, including forfeiture of marks for the piece of work submitted, a zero grade for the paper, or in extreme cases exclusion from the University.

### General

- (h) Any student who attempts to deceive or practice deceit, or obtain unfair advantage by their actions as a student may be subject to disciplinary action.

### 11.5 Reassessment Policy

- Radiation Therapy Practice II
  - reassessment can occur for the clinical journal
  - reassessment can occur in two domains for each enrolment of the paper
  - if a student fails all three domains they are not eligible for reassessment and fail the paper overall.
- Radiation Therapy Planning Concepts II
  - one reassessment can occur if the pass mark of 60% is not achieved in the dosimetry viva.
  - any student requiring a viva reassessment will only be able to gain a final mark of 24/40 (60% pass mark). The purpose of the reassessment is to gain further information to determine if the student has the required knowledge to pass the paper – it may be that a global perspective is necessary to achieve this. However the final grade, if it is deemed the student is able to pass will be 24/40 (the minimum pass mark)
- Radiation Therapy Practice III
  - reassessment can occur in two domains for each enrolment of the paper.
  - if a student fails all three domains they are not eligible for reassessment and fail the paper overall.
- Radiation Therapy Planning Concepts III
  - one reassessment can occur if the pass mark of 67% is not achieved in the dosimetry viva.
  - any student requiring a viva reassessment will only be able to gain a final mark of 33.5/50 (67% pass mark). The purpose of the reassessment is to gain further information to determine if the student has the required knowledge to pass the paper – it may be that a global perspective is necessary to achieve this. However the final grade, if it is deemed the student is able to pass will be 33.5/50 (the minimum pass mark).

### 11.6 Examination

- (a) Every candidate must gain terms before being admitted to examinations. This is defined as at least a 50% pass in the coursework component, and have met all coursework requirements.
- (b) Students will need to achieve at least 50% in the examination to be eligible to be awarded a Pass overall.
- (c) There will be no aegrotat passes, although students may be eligible to apply for special consideration for a deferred examination.
- (d) Candidates who fail to gain terms shall subsequently pursue a course of study approved by the respective Faculty Board or Board of Studies.
- (e) A candidate who fails any paper may, on the recommendation of the examiners, be admitted to a special examination.

**11.7 Awarding of Degree**

Candidates must pass all papers in the programme to be awarded the Bachelor of Radiation Therapy degree by the University of Otago.

**11.8 Withdrawal from the Course**

A candidate who withdraws from the course must obtain the approval of the Radiation Therapy Board of Studies and Examinations before being readmitted to the course. Applications for readmission must be with the Board of Studies and Examinations by 1 November in the year prior to that for which readmission is sought.

**11.9 Exclusion from the Course**

Any candidate who fails to complete the requirements for a paper in two academic years may be excluded by the Board of the Division of Health Sciences on the recommendation of the Radiation Therapy Board of Studies and Examinations in Health Sciences.

**11.10 Variations**

The Pro-Vice-Chancellor (Health Sciences) may in exceptional circumstances approve a course of study which does not comply with these regulations.



**PAPER  
DESCRIPTORS**

## **STAGE ONE PAPERS**

RADT 111	Anatomy & Imaging
RADT 112	Cancer Cell Biology
RADT 113	Health & Human Behaviour
RADT 114	Healthcare Communication
RADT 115	Radiation Technology I
RADT 116	Radiation Therapy and Oncology I
RADT 117	Radiation Therapy Planning Concepts I

## 12. Anatomy and Imaging

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<b>Reference Number</b>	RADT 111
<b>Date:</b>	February 2014
<b>Duration:</b>	150 contact hours and 225 hours of independent learning
<b>Points:</b>	30
<b>Aim:</b>	To gain a basic understanding of the gross and sectional anatomy of the human body and to be able to identify body structures on radiographic images
<b>Recommended Entry Level:</b>	Entry to the programme
<b>Learning outcomes:</b>	On the completion of this paper the successful student will be able to: <ol style="list-style-type: none"><li>1. describe the anatomical organisation of the human body in terms of cells, tissues and organs for each of the principal organ systems;</li><li>2. describe in detail the lymphatic drainage of structures affected by cancer;</li><li>3. be able to relate surface anatomy to underlying body structures;</li><li>4. use knowledge of gross body anatomy to identify body structures on X-rays, CT scans and MRI scans.</li></ol>

### **Content:**

#### **Corresponding to learning outcome 1**

- (a) Cell types, tissue types, organs and function of:
- Integumentary system
  - Skeletal system
  - Muscular system
  - Cardiovascular system
  - Lymphatic system
  - Respiratory system
  - Digestive system
  - Urinary system
  - Reproductive systems
  - Endocrine system
  - Nervous system

### **Corresponding to learning outcome 2**

- (a) Lymphatic drainage of structures in: head and neck, thorax, abdomen, pelvis and extremities

### **Corresponding to learning outcome 3**

- (a) Body regions and planes
- (b) Boundaries and contents of body cavities
- (c) Clinical significance of surface land marks and planes of head, thorax, abdomen and extremities

### **Corresponding to learning outcome 4**

- (a) Principles and diagnostic purpose of X-rays, CR scans, MRI scans;
- (b) Identification of structures on X-rays, CT scans and MRI scans.

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- Lectures
- Student centred tutorials
- The use of models, X-rays, CT scan and MRI scans

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following:

- one test = 15% of total mark
- one test = 15% of total mark
- one test = 15% of total mark
- one test = 15% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to sit the final examination. A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

### **Reporting Results to Students**

Results will be reported to students as follows:

Coursework	60
Final examination	40
TOTAL	100

Student result notices will carry grades from A to E



## Resources

Bridge, P. & Tipper, D.J. (2011). *CT Anatomy for Radiotherapy*. M&K Publishing, Cumbria

Moeller, T.B. & Reif, E. (2007). *Pocket Atlas of Sectional Anatomy, CT and MRI, Vol 1 & Vol 2*. (3<sup>rd</sup> Edition). Thieme, New York.

Tortora, G.J. & Nielson, M.T. (2012). *Principles of Human Anatomy*. (12th Edition). John Wiley & Sons.

Webber, E.C., Vilensky, J.A. & Carmichael, S.W. (2009). *Netter's Concise Radiologic Anatomy*. Saunders, an imprint of Elsevier Inc.

## 13. Cancer Cell Biology

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<b>Reference Number</b>	RADT 112
<b>Date:</b>	February 2014
<b>Duration:</b>	50 contact hours and 75 hours of independent learning
<b>Points:</b>	10
<b>Aim:</b>	To gain a basic understanding of cancer cell biology
<b>Recommended entry level:</b>	Entry to the programme
<b>Learning outcomes:</b>	On the completion of this paper the successful student will have a basic understanding of:

1. DNA synthesis and gene expression;
2. cell cycle and cell cycle progression;
3. mutagenesis and carcinogenesis;
4. radiobiology of normal tissues and tumours;
5. chemotherapy ;
6. immunotherapy.

### **Content:**

#### **Corresponding to learning outcome 1**

- (a) Basic biochemistry, including structure of DNA and RNA
- (b) Genetic code
- (c) Molecular dogma (DNA synthesis, transcription, reverse transcription, translation)

#### **Corresponding to learning outcome 2**

- (a) Cell cycle, check points and progression

#### **Corresponding to learning outcome 3**

- (a) Mutagenesis (chemically, virally, radiation-induced)
- (b) Epigenetics (methylation, acetylation)
- (c) Carcinogenesis (tumour suppressor genes, proto-oncogenes, cell cycle progression, tumour staging)

#### **Corresponding to learning outcome 4**

- (a) Radiobiology of healthy tissues (pathology and kinetics, 4Rs)
- (b) Radiobiology of tumours

#### **Corresponding to learning outcome 5**

- (a) Principles of pharmacology
- (b) Chemotherapy that targets fast proliferating cells
- (c) Targeted Chemotherapy
- (d) Hormone therapy

### Corresponding to learning outcome 6

- (a) Basic immunology
- (b) Escaping immuno-surveillance
- (c) Antibody based therapies
- (d) Adoptive immune transfer and immune vaccines

### Suggested learning and Teaching Approaches

The learning outcomes of this paper could be achieved by the following:

- Lectures
- Student centred tutorials
- The use of videos, books and journals

### Assessment of Learning Outcomes

Summative assessment will consist of the following:

- one test = 30% of total mark
- one test = 30% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to take the final examination. A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

### Reporting Results to Students

Results will be reported to students as follows:

Coursework	60
Final Examination	40
TOTAL	100

Student result notices will carry grades from A to E

### Resources

Bryant, B. and Knights, K. (2007). *Pharmacology for Health Professionals (2<sup>nd</sup> edition)*. Mosby, Elsevier, Australia.

Campbell, M.K. (1999), *Biochemistry (3<sup>rd</sup> edition)*. Saunders College publishing.

Cooper, G.M. (1997). *The cell: a molecular approach*. ASM Press, USA.

Delves, P.J., Martin, S.J., Burton, D. R. and Roitt, I. M. (2006). *Roitt's Essential Immunology (11<sup>th</sup> edition)*. Blackwell publishing, UK

McCance, K.L. and Huether, S. E. (2002). *Pathophysiology. The biologic basis for disease in adults and children (4<sup>th</sup> edition)*. Mosby, Elsevier, Australia

Martini. F.H. (2006) *Fundamentals of anatomy and physiology (7<sup>th</sup> edition)*. Pearson, Benjamin Cummings, USA

Springhouse. (2008). *Clinical pharmacology made incredibly easy (3<sup>rd</sup> edition)*. Lippincott, Williams and Wilkins, USA

## 14. Health and Human Behaviour

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<b>Reference Number :</b>	RADT 113
<b>Date :</b>	February 2014
<b>Duration :</b>	40 contact hours and 72.5 hours of independent learning
<b>Points :</b>	9
<b>Aim :</b>	To introduce students to the psychological and sociological models of thinking about health, illness and coping with life-threatening illness and to apply this knowledge to the radiation therapy setting.

**Recommended Entry Level :** Entry to programme

**Learning Outcomes :** On completion of this paper the successful student will be able to :

1. demonstrate an understanding of the relationship between health, well-being and human behaviour;
2. identify social, political, economic and cultural determinants of health;
3. discuss stress and coping in relation to diagnosis of and treatment(s) for life-threatening illness, with special emphasis on cancer;
4. discuss risk and protective factors across the lifespan that affect coping with life-threatening illness;
5. discuss the relevance of culture to an individual's and group's experience of society with particular reference to health and illness;
6. describe the relevance of the Treaty of Waitangi to New Zealand society and the delivery of health care;
7. discuss decision-making in relation to diagnosis, side-effects and survivorship of cancer and its treatment(s);
8. identify research methodologies in health psychology and health sociology.

### **Content:**

#### **Corresponding to Learning Outcome 1**

- (a) Definitions of health, well-being, illness and disease
- (b) Health beliefs and health behaviour
- (c) Theoretical perspectives of personality, learning and social learning, motivation and perception

#### **Corresponding to Learning Outcome 2**

- (a) Systems of inequality based on class, age, gender, race, ethnicity, disability, sexual orientation,
  - prejudice, stereotyping, discrimination and stigma

- (b) Inequalities in New Zealand society
- (c) The consequences of inequalities in access to resources, including health for the individual, family and society, with an emphasis on cancer

### **Corresponding to Learning Outcome 3**

- (a) Causes and effects of stress on individuals
- (b) Stress and the immune system
- (c) Reactions to illness: interactions between physical, mental, emotional and social phenomena
- (d) Coping strategies in relation to stress and illness

### **Corresponding to Learning Outcome 4**

- (a) Psychosocial modifiers of stress and coping across the lifespan
- (b) Contextual influences on risk and protective factors that affect coping
- (c) Human development and health

### **Corresponding to Learning Outcome 5**

- (a) The meaning and relevance of culture to individual and group self perception, beliefs and practices
- (b) The relevance of culture to New Zealand society
- (c) Culture, health, illness, and health care delivery in the radiation therapy setting
- (d) Cultural safety in health care delivery

### **Corresponding to Learning Outcome 6**

- (a) The Treaty of Waitangi and its significance to Maori and Pakeha
- (b) The relevance and application of the Treaty of Waitangi to health, illness and health care delivery

### **Corresponding to Learning Outcome 7**

- (a) Cognition and health beliefs
- (b) Clinical decision making
- (c) Adherence to treatment, management of side-effects, survivorship/ living with life-threatening illness

### **Corresponding to Learning Outcome 8**

- (a) Quantitative research methodology in health psychology and sociology
- (b) Qualitative research methodology in health psychology and sociology

### **Suggested Learning and Teaching Approaches :**

The learning outcomes of this paper could be achieved by the following :

- student centred tutorials with an emphasis on class discussion and debate;
- the use of research-based evidence;
- guest speakers who are able to offer current and practical information on topics;
- case studies and problem based learning;
- seminar and project presentations;

- the use of media such as videos, journals, texts, newspaper articles and television will provide a rich source of material for discussion, exploration and debate;
- use of a variety of small scale investigative techniques.

### Assessment of Learning Outcomes :

Summative assessment will consist of the following :

- one assignment = 25% of total mark
- one assignment = 35% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to sit the final examination. A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

### Reporting Results to Students

Results will be reported to students as follows:

Coursework	60
Final examination	40
TOTAL	100

Student result notices will carry grades from A to E

### Resources

- Alfaro-LeFevre, R. (2004). *Critical thinking and clinical judgement: A practical approach*. St Louis, Mo.: Saunders.
- Bird, L., & Drewery, W. (2004). *Human Development in Aotearoa*. (2<sup>nd</sup> Ed.). McGraw Hill, Auckland.
- Blakely, T. (2007). *Tracking disparity: Trends in Ethnic and Socioeconomic Inequalities in Mortality, 1981-2004*. Ministry of Health: Wellington, NZ.
- Brennan, J., & Moynihan, C. (2004). *Cancer in Context: A Practical Guide to Supportive Care*. Oxford: Oxford University Press.
- Camic, P.M., Rhodes, J.E. & Yardley, L. (2003). *Qualitative Research in Psychology: Expanding Perspectives in Method and Design*. Washington, DC: American Psychological Association.
- Cooper, C.L. (2005). (Ed.). *Handbook of Stress Medicine and Health*. Boca Raton: CRC Press.
- Davidson, C. and Tolich, M. (Eds.). (2007). *Social Science Research in New Zealand: Many Paths to Understanding*. (2<sup>nd</sup> Ed.). North Shore: Pearson Education New Zealand.
- Davis, P., & Dew, K. (2005). *Health and Society in Aotearoa New Zealand*. (2<sup>nd</sup> Ed.). Wellington: Oxford University Press.
- Dew, K. (2003). *Borderland Practices: Regulating Alternative Therapies in New Zealand*. Dunedin: University of Otago Press.
- Dew, K., & Kirkman, A. (2002). *Sociology of Health in New Zealand*. Auckland: Oxford University Press.
- Durie, M. (1998). *Whaiora: Maori Health Development*. (2<sup>nd</sup> Edition). Auckland: Oxford University Press.
- Durie, M. (2001). *Mauri Ora: The Dynamics of Maori Health*. Auckland. Oxford University Press.
- Feurerstein, M. (2007). (Ed.). *Handbook of Cancer Survivorship*. New York: Springer.

- Germov, J. (Ed.). (2000). *Second Opinion; An Introduction to Health Sociology*. (2<sup>nd</sup> Ed.). Melbourne: Oxford University Press.
- Goodwin, James C. (2005). *Research in Psychology: Methods and Design*. Hoboken, NJ: John Wiley & Sons.
- Gurbutt, R. (2006) *Nurses' clinical decision making*. Oxford: Radcliffe.
- Harms, L. (2005). *Understanding Human Development: A Multidimensional Approach*. Melbourne: Oxford University Press.
- Jones, K., & Creedy, D. (2008). *Health and Human Behaviour*. (2<sup>nd</sup> Ed.). Melbourne: Oxford University Press.
- Kerslake, P. (2006). *Life, Happiness and Cancer: Survive with Action and Attitude*. Wellington, NZ: Steele Roberts Ltd.
- Lee, C., & Glynnowens, R. (2002). *The Psychology of Men's Health*. Buckingham. Open University Press.
- Lupton, D. (1994). *Medicine as culture: Illness, Disease and the Body in Western Societies*. London: Sage Publications.
- McLennan, G., Ryan, A. & Spoonley, P. (2004). *Exploring Society: Sociology for New Zealand Students*. Auckland: Pearson Education New Zealand.
- Macpherson, C., Spoonley, P. & Anae, M. (Eds.). (2000). *Tangata o te moana nui: The evolving identities of Pacific peoples in Aotearoa New Zealand*.
- Ministry of Health. (2002). *Reducing Inequalities*. Wellington: Ministry of Health.
- Ministry of Health. (2002). *He Korowai Oranga (Maori Health Strategy)*. Wellington. Ministry of Health.
- Ministry of Health. (2004). *Tupu Ola Moui: The Pacific Health Chart Book*. Wellington, NZ: Ministry of Health.
- Ministry of Health. (2005). *New Zealand Cancer Control Strategy: Action Plan 2005-2010*. Wellington: Ministry of Health.
- Nettleton, S. (1995). *The Sociology of Health and Illness*. Cambridge: Polity Press
- Ratima, M.M. (2001). *Kia uruwru mai a harora: Being Healthy, Being Maori*. Conceptualising Maori health promotion. Unpublished dissertation.
- Santrock, J.W. (2008). *Life-Span Development*. (11<sup>th</sup> Ed.). Boston: McGraw-Hill.
- Sarafino, E.P. (2002). *Health Psychology: Biopsychosocial interactions*. (4<sup>th</sup> Ed.). New York: Wiley.
- Spoonley, P. (1993). *Racism and Ethnicity*. Auckland: Oxford University Press.
- State Services Commission. (2004). *The Treaty or Waitangi*. Wellington. State Services Commission.
- Swan, R. (1996). *The Big C: My experience with Cancer*. Auckland: Hoddermoa Beckett Publishers.
- Thompson, C., & Dowding, D. (Eds.). (2002). *Clinical decision making and judgement in nursing*. Edinburgh: Churchill Livingstone.
- Weiten, W. (2004). *Psychology: Themes and Variations*. (6<sup>th</sup> Ed.). Brooks/Cole.
- Wepa, D; (2005). *Cultural safety in Aotearoa NZ*. Auckland: Pearson Education NZ.
- White, P. (2005). (Ed.). *Biopsychosocial Medicine: An Integrated Approach to Understanding Illness*. Oxford: Oxford University Press.

## 15. Healthcare Communication

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<b>Reference Number :</b>	RADT 114
<b>Date :</b>	July 2014
<b>Duration :</b>	50 contact hours and 62.5 hours of independent learning
<b>Points :</b>	9
<b>Aim :</b>	To introduce students to the foundations of healthcare communication skills and strategies and apply these to the radiation therapy setting.

**Learning Outcomes :** On completion of this paper the successful student will be able to :

1. describe core qualities and skills involved in establishing a healthcare professional-patient relationship in the radiation therapy setting;
2. demonstrate an understanding of core verbal and non-verbal communication skills in a range of contexts;
3. analyse different social, professional and personal value bases in the provision of healthcare;
4. identify the principles of culturally safe healthcare practice in the radiation therapy setting.

### **Content**

#### **Corresponding to Learning Outcome 1**

- (a) Core qualities, attitudes and skills of a healthcare professional  
Social and emotional intelligence
  - Empathy
  - Rapport
  - Respect
- (b) Professional relationships in the health care setting: patients, their families and colleagues
  - Ethical practice
  - Trust
  - Control
  - Self-disclosure
  - Self-care and self-reflection

#### **Corresponding to Learning Outcome 2**

- (a) Core verbal and nonverbal communication skills in health care relationships
  - multidimensional approach to listening
  - communication microskills: verbal and nonverbal
  - affirm, motivate, and educate others
- (b) Cross cultural communication



- (c) Communication contexts
  - environmental
  - social and political
  - ethical
- (d) Interviewing skills
- (e) Communication within healthcare teams
- (f) Speaking to a group

### **Corresponding to Learning Outcome 3**

- (a) Personal values and moral development
- (b) Professional values in health care
- (c) Social values in health care

### **Corresponding to Learning Outcome 4**

- (a) Cultural diversity, cultural safety and cultural competence
- (b) Social and personal attitudes towards diversity and equality
  - prejudice, stereotyping, discrimination and stigma
- (c) Professional culturally safe practice in New Zealand

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following :

- student centred tutorials with an emphasis on class discussion and debate;
- guest speakers who are able to offer current and practical information on topics;
- case studies and problem based learning;
- simulated clinical scenarios with the lecturer, actors and others modelling and coaching appropriate behaviours;
- the use of media such as videos, journals, texts, newspaper articles and television will provide a rich source of material for discussion, exploration and debate;
- use of a variety of small scale investigative techniques;
- the teaching material should draw on the student's personal and professional experiences and encourage critical inquiry and examination of the "taken for granted world".

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following:

- one assignment = 50% of total mark
- one observational analysis = 50% of total mark

A pass will be awarded to all students who gain 50% overall.

### **Reporting Results to Students**

Results will be reported to students as follows:

Coursework out of 100

Student result notices will carry grades from A to E.

## Resources

- Andrews, M.M., & Boyle, J.S. (2003). *Transcultural concepts in nursing care*. (4<sup>th</sup> Ed.). Philadelphia: Lippincott Williams & Wilkins.
- Berglund, C. & Saltman, D. (Eds.). (2002). *Communication in health care*. Oxford University Press: Melbourne.
- Durie, M. (1998). *Whaiora: Maori health development*. (2<sup>nd</sup> Edition). Auckland: Oxford University Press.
- Durie, M. (2001). *Mauri ora: The dynamics of Maori health*. Auckland. Oxford University Press.
- Egan, G. (2007). *The skilled helper: A problem-management and opportunity-development approach to helping*. Belmont, CA: Thomson Brooks/Cole.
- Harms, L. (2007). *Working with people*. Melbourne: Oxford University Press.
- Hosley, J. & Molle, E.A. (2006). *A practical guide to therapeutic communication for health professionals*. St Louis, Mo.: Saunders Elsevier.
- Leininger, M. M., and McFarland, M. R. (2006). (Eds.). *Culture care diversity and universality: a worldwide nursing theory*. Sudbury, MA: Jones and Bartlett.
- Leininger, M.M., & McFarland, M.R. (2002). *Transcultural nursing: concepts, theories, research and practice*. New York: McGraw-Hill.
- Ministry of Health. (2004). *Tupu Ola Moui: The Pacific Health Chart Book*. Wellington, NZ: Ministry of Health.
- Ministry of Health (2003). *New Zealand Cancer Control Strategy*. Wellington, NZ: Ministry of Health.
- Ministry of Health (2002). *He Korowai Oranga (Maori Health Strategy)*. Wellington., NZ: Ministry of Health.
- Nursing Council of New Zealand. (2005). *Guidelines for cultural safety, the Treaty of Waitangi and Maori health in nursing education and practice*. Wellington, NZ: Nursing Council of New Zealand.
- Platt, F.W. & Gordon, G.H. (2004). *Field guide to the difficult patient interview*. Philadelphia: Lippincott Williams & Wilkins.
- Satcher, D., Pamies, R.J. & Woelfl, N.N. (2006). *Multicultural medicine and health disparities*. New York: McGraw-Hill.
- Spoonley, P., Pearson, D.G., & Macpherson, C. (2004). (Eds.). *Tangata, tangata: the changing contours of New Zealand*. Southbank, Vic.: Thomson.
- State Services Commission. (2004). *The Treaty of Waitangi*. Wellington. State Services Commission.
- The Journal of Multicultural Nursing and Health [electronic resource].
- Thompson, N. (2002). *People skills*. Basingstoke: Palgrave.
- Verderber, K.S. & Verderber, R.F. (2004). *Inter-act: Interpersonal communication concepts, skills and contexts*. New York: Oxford University Press.
- Wepa, D; (2005). *Cultural safety in Aotearoa NZ*. Auckland: Pearson Education NZ.

## 16. Radiation Technology I

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<b>Reference Number :</b>	RADT 115
<b>Date :</b>	February 2014
<b>Duration :</b>	90 contact hours and 135 hours of independent learning
<b>Points :</b>	18
<b>Aim :</b>	To introduce students to the basic principles of radiation physics, the application to radiation technology and the use of radiation therapy equipment.
<b>Recommended Entry Level:</b>	Entry to the programme
<b>Learning Outcomes :</b>	On completion of this paper the successful student will be able to: <ol style="list-style-type: none"><li>1. demonstrate an understanding of general physical principles in relation to radiation therapy;</li><li>2. discuss the basic physics of X and gamma radiation;</li><li>3. describe the principles of radiation protection and safety;</li><li>4. describe the principles of construction and operation of radiation therapy and imaging equipment;</li><li>5. describe the principles of diagnostic imaging technologies;</li><li>6. demonstrate an understanding of the use of computers and their applications.</li></ol>

### Content

#### Corresponding to Learning Outcome 1

- (a) Measurement – units, uncertainties
- (b) Systematic and random errors
- (c) Properties of electromagnetic radiation
- (d) Light sources (point sources, extended sources, lasers)
- (e) Electric charge, fields, potential
- (f) DC circuits and electrical measurements
- (g) Alternating current and rectification

#### Corresponding to Learning Outcome 2

- (a) Ionizing radiation, exposure, dose
- (b) Production of X-rays
- (c) Radioactive decay and the production of gamma rays
- (d) Interaction of radiation with matter, absorption processes
- (e) Measurement of radiation

### **Corresponding to Learning Outcome 3**

- (a) Radiation protection principles
- (b) Radiation safety legislation
- (c) Personnel monitoring

### **Corresponding to Learning Outcome 4**

- (a) Kilovoltage X-ray units, power supplies and x-ray tubes
- (b) Megavoltage X-ray units, linear accelerator technology

### **Corresponding to Learning Outcome 5**

- (a) Radiographic imaging, contrast agents, film, fluoroscopy
- (b) Digital imaging, digital detectors, digital image processing
- (c) CT
- (d) MRI
- (e) PET
- (f) Ultrasound
- (g) Nuclear medicine imaging

### **Corresponding to Learning Outcome 6**

- (a) Computer hardware and operation
- (b) Software applications (word processing, spreadsheets, PowerPoint)

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- lectures
- student centred tutorials
- laboratory demonstrations and practical sessions

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following :

- one test = 20% of total mark
- one test = 20% of total mark
- one test = 20% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework and the computer assignment must be successfully completed to be eligible to take the final examination.

A pass will be awarded to all students who gain a minimum of 50% in the examination and 50% overall.

### **Reporting Results to Students**

Results will be reported to students as follows:

Coursework	60
Final examination	40
TOTAL	100

Student result notices will carry grades from A to E

## Resources

### Electronic Media

European Society for Therapeutic Radiography and Oncology (ESTRO) <http://www.estro.org>

American Association of Physicists in Medicine (AAPM) <http://www.aapm.org/>

International Atomic Energy Agency (IAEA) <http://www.iaea.org/>

Varian Medical Systems <http://www.varian.com/>

Elekta <http://www.elekta.com/>

GE Healthcare <http://www.gehealthcare.com>

US National Cancer Institute <http://www.cancer.gov/>

Siemens Medical <http://www.medical.siemens.com>

### Textbooks

Ball, J., & Moore, A. (1997) *Essential Physics for Radiographers*. Blackwell Scientific.

Bomford, C.K. & Kunkler, I.H. (2003) *Walter and Miller's textbook of radiotherapy : radiation, physics, therapy and oncology*. (6th ed.) Edinburgh, Churchill Livingstone.

Bushong, S C. (2001) *Radiologic science for technologists : physics, biology, and protection*. St. Louis : Mosby.

Bushberg, J. T. (2002) *The essential physics of medical imaging*. Philadelphia, Pa.; London : Lippincott Williams & Wilkins.

Chesney, D., & Chesney, M. (1984). *Chesney's equipment for student radiographers*. Blackwell Scientific.

Graham, D.T., Cloke, P. & Vosper, M. (2011). *Principles of Radiological Physics*. (6<sup>th</sup> Edition). Edinburgh, Churchill Livingstone.

Giancoli, D.C. (2005). *Physics - Principles with Applications*. (6<sup>th</sup> Edition). Prentice Hall, USA.

Greene, D & Williams, P. (1997) *Linear accelerators for radiation therapy* Institute of Physics Publishing

Guy, G. & Ffytche, D. (2005) *An introduction to the principles of medical imaging*. London : Imperial College Press.

Hendee, W. & Ritenour R. (2002). *Medical imaging physics*. New York ; Chichester : Wiley-Liss,

Hazle, J D. & others (1998) *Imaging in radiation therapy : American Association of Physicists in Medicine 1998 Summer School proceedings*, University of Wisconsin, Madison, Wisconsin.. Madison, WI : Published for the American Association of Physicists in Medicine by Medical Physics Pub.

Karzmark, C. J (1998) *A primer on theory and operation of linear accelerators in radiation therapy*. Madison, Wis. Medical Physics Pub.

Khan, F. (2003). *The Physics of Radiation Therapy*. (3<sup>rd</sup> Edition). Williams and Wilkins, Baltimore.

Morris, S. (2001). *Radiotherapy physics and equipment*. Churchill Livingstone.

Purdy, J A. (2001) *3-D conformal and intensity modulated radiation therapy : physics & clinical applications*. Madison, WI, U.S.A. Advanced Medical Pub.

Roberts, D., & Smith, N. (1988). *Radiographic Imaging*. Churchill Livingstone.

Stanton, R., & Stinton, D. (1992). *An Introduction to Radiation Oncology Physics*. Medical Physics Publishing.

Washington, C.M., & Leaver, D.T. (2010) *Principles and Practice of Radiation Therapy*. (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.

## 17. Radiation Therapy and Oncology I

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<b>Reference Number:</b>	RADT 116
<b>Date:</b>	February 2014
<b>Duration:</b>	150 hours contact and 225 hours independent learning
<b>Points:</b>	30
<b>Aim:</b>	To enable students to gain a basic understanding of oncology, and the treatment modalities available to treat malignant disease.
<b>Recommended Entry Level:</b>	Entry to programme
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to describe and discuss in some detail:

1. legal and ethical issues related to radiation therapy and patient care;
2. pathology of common tumours and the ways in which they are classified;
3. treatment modalities used to treat benign and malignant disease;
4. radiation therapy techniques used in the treatment of disease;
5. care a patient may require when receiving radiation therapy;
6. chemotherapy for patients with malignant disease;
7. pharmacological approach to patient care during radiation therapy;
8. commonly used mould room techniques;
9. clinical trials.

### Content

#### Corresponding to Learning Outcome 1

- (a) Code of Ethics
- (b) Ethical issues and privacy
- (c) Relevant legislation
- (d) Informed consent
- (e) Professional organizations/Registration Boards
- (f) Introduction to the health system
- (g) Use of clinical information

#### Corresponding to Learning Outcome 2

- (a) Malignant tumours
- (b) Benign tumours treated with radiation therapy
- (c) Epidemiology
- (d) Aetiology
- (e) Classification systems

### **Corresponding to Learning Outcome 3**

- (a) Surgery
- (b) Radiation therapy
- (c) Chemotherapy (including hormone therapy)
- (d) Other treatment modalities
- (e) Principles underlying the choice of treatment

### **Corresponding to Learning Outcome 4**

- (a) Radical intent
- (b) Palliative intent
- (c) Pre and post operative techniques
- (d) Adjuvant techniques

### **Corresponding to Learning Outcome 5**

- (a) Local reactions to radiation therapy
- (b) Systemic reactions to radiation therapy
- (c) Blood counts
- (d) Diet and fluid intake
- (e) Patient information
- (f) Manual handling
- (g) Infection control
- (h) Specific patient needs, ie. catheter/colostomy, bedpan

### **Corresponding to Learning Outcome 6**

- (a) Principles of chemotherapy for cancer
- (b) Side effects of chemotherapy

### **Corresponding to Learning Outcome 7**

- (a) Pharmacological principles
- (b) Adverse reactions to drugs
- (c) Medications used for radiation therapy reactions
- (d) Management of side effects including chemotherapy

### **Corresponding to Learning Outcome 8**

- (a) Immobilisation devices
- (b) Tissue compensators
- (c) Electron cut outs
- (d) Shielding
- (e) Bolus

### **Corresponding to Learning Outcome 9**

- (a) Phase I, I, III, IV clinical trials
- (b) Clinical trial groups in radiation therapy (e.g. TROG)
- (c) Publications

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- student centred tutorials with an emphasis on class discussion and debate;
- the use of media such as videos, journals, texts, newspaper articles and television will provide a rich source of material for discussion, and exploration;
- three one week visits to a radiation therapy department

## Assessment of Learning Outcomes

Summative assessment will consist of the following :

- one test = 20% of total mark
- one test = 20% of total mark
- one assignment = 20% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework and the clinical assignment must be successfully completed to be eligible to take the final examination.

A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

## Reporting Results to Students

Results will be reported to students as follows:

Coursework	60
Final examination	40
TOTAL	100

Student result notices will carry grades from A to E

## Resources

*A Guide to Palliative Care in New Zealand.* (2nd Edition). Douglas Pharmaceuticals 1992.

Baird, S. (1991). *A Cancer Source Book for Nurses.* (6th Edition). American Cancer Society.

*Blackburns Introduction to Clinical Radiation Therapy.* (1989) Medical Physics Publishing Co-Op, Madison

Bomford, C., Kunkler, I., & Sherriff, S. (2003). *Walter & Miller's Textbook of Radiotherapy.* (6<sup>th</sup> Edition). Churchill Livingstone.

Bryant, B., & Knights K. (2007). *Pharmacology for Health Professionals* (2<sup>nd</sup> Edition). Mosby Elsevier, Sydney

*Clinical Pharmacology made Incredibly Easy* (2<sup>nd</sup> Edition) Lippincott Williams and Wilkins 2003

Coia, L., & Moycan, D. (1989). *Introduction to Clinical Radiation Oncology.* Medical Physics Publishing Co-Op, Madison.

Faithfull, S., & Wells, M. (2003). *Supportive Care in Radiotherapy* Churchill Livingstone, Edinburgh

Griffiths, S., & Short, C. (1994). *Radiotherapy : Principles to Practice.* Churchill Livingstone.

Hass, M.L., Hogle, W.P., Moore-Higgs, G.J. & Gosselin-Acomb, T.K. (2007). *Radiation Therapy: A guide to patient care.* Mosby Elsevier, St Louis.

International Commission on Radiation Units and Measurements: (1993) Prescribing, Recording, and Reporting Photon Beam Therapy. (*ICRU Report 50*)

International Commission on Radiation Units and Measurements: (1999) Prescribing, Recording, and Reporting Photon Beam Therapy. Supplement to ICRU 50 (*ICRU Report 62*).

Moller, T.B. & Reif, E. (2006). *Pocket Atlas of Sectional Anatomy, CT and MRI, Vol 1 & Vol 2.* (3<sup>rd</sup> Edition). Thieme, New York.

Neal, A. & Hoskin, P. (2003). *Clinical Oncology - Basic Principles and Practice.* (3<sup>rd</sup> Edition). Edward Arnold.

Washington, C.M. & Leaver, D.T. (2010). *Principles and Practice of Radiation Therapy.* (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.



## 18. Radiation Therapy Planning Concepts I

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<b>Reference Number:</b>	RADT 117
<b>Date:</b>	July 2014
<b>Duration:</b>	70 hours contact and 105 hours independent learning
<b>Points:</b>	14
<b>Aim:</b>	To enable students to gain a basic understanding of planning the treatment of malignant disease
<b>Recommended Entry Level:</b>	Entry to programme
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to demonstrate: <ol style="list-style-type: none"><li>1. knowledge of basic calculations used in radiation therapy;</li><li>2. an understanding of manual planning principles;</li><li>3. knowledge and performance of basic principles and concepts of computer planning.</li></ol>

### Content

#### Corresponding to Learning Outcome 1

- (a) Calibration conditions
- (b) Inverse square law
- (c) Attenuation factors for SSD and SAD techniques
- (d) Manual calculations of basic radiation therapy SSD and SAD treatment techniques

#### Corresponding to Learning Outcome 2

- (a) Isodose distributions
- (b) ICRU 50/62
- (c) Normalisation
- (d) Weighting
- (e) Beam energy, d-max, exit dose and arrangement
- (f) Organs at risk

#### Corresponding to Learning Outcome 3

- (a) Isodose distributions
- (b) Computer planning principles
- (c) ICRU 50/62
- (d) Normalisation

- (e) Weighting
- (f) Beam energy, d-max, exit dose and arrangement
- (g) Inhomogeneities
- (h) Wedges
- (i) Monitor Units
- (j) Field verification
- (k) Organs at risk

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- practical laboratory tutorials for computer planning
- student centred tutorials with an emphasis on class discussion and debate
- the use of media such as videos, journals, and texts, will provide a rich source of material for discussion, and exploration;

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following:

- one test = 40% of total mark
- one assignment = 30% of total mark
- one viva = 30% of total mark

A pass will be awarded to all students who gain 50% overall.

### **Reporting Results to Students**

Results will be reported to students as follows:

Coursework out of 100

Student result notices will carry grades from A to E

### **Resources**

Eclipse Planning System

#### **Textbooks**

- Bomford, C., Kunkler, I., & Sherriff, S. (2003). *Walter & Miller's Textbook of Radiotherapy*. (6<sup>th</sup> Edition). Churchill Livingstone.
- Ball, J., & Moore, A. (1997) *Essential Physics for Radiographers*. Blackwell Scientific.
- Bomford, C.K. & Kunkler, I.H. (2003) *Walter and Miller's textbook of radiotherapy : radiation, physics, therapy and oncology*. (6th ed.) Edinburgh, Churchill Livingstone.
- Bushberg, J. T. (2002) *The essential physics of medical imaging*. Philadelphia, Pa.; London : Lippincott Williams & Wilkins.
- Giancoli, D.C. (2005). *Physics - Principles with Applications*. (6<sup>th</sup> Edition). Prentice Hall, USA.
- Coia, L., & Moycan, D. (1989). *Introduction to Clinical Radiation Oncology*. Medical Physics Publishing Co-Op, Madison.
- Greene, D & Williams, P. (1997) *Linear accelerators for radiation therapy* Institute of Physics Publishing
- Griffiths, S., & Short, C. (1994). *Radiotherapy : Principles to Practice*. Churchill Livingstone.

- Hass, M.L., Hogle, W.P., Moore-Higgs, G.J. & Gosselin-Acomb, T.K. (2007). *Radiation Therapy: A guide to patient care*. Mosby Elsevier, St Louis.
- Hendee, W. & Ritenour R. (2002). *Medical imaging physics*. New York ; Chichester : Wiley-Liss,
- International Commission on Radiation Units and Measurements: (1993) Prescribing, Recording, and Reporting Photon Beam Therapy. (*ICRU Report 50*)
- International Commission on Radiation Units and Measurements: (1999) Prescribing, Recording, and Reporting Photon Beam Therapy. Supplement to ICRU 50 (*ICRU Report 62*).
- Khan, F. (2003). *The Physics of Radiation Therapy*. (3<sup>rd</sup> Edition). Williams and Wilkins, Baltimore.
- Moller, T.B. & Reif, E. (2006). *Pocket Atlas of Sectional Anatomy, CT and MRI, Vol 1 & Vol 2*. (3<sup>rd</sup> Edition). Thieme, New York.
- Morris, S. (2001). *Radiotherapy physics and equipment*. Churchill Livingstone.
- Purdy, J A. (2001) *3-D conformal and intensity modulated radiation therapy : physics & clinical applications*. Madison, WI, U.S.A. Advanced Medical Pub.
- Stanton, R., & Stinton, D. (1992). *An Introduction to Radiation Oncology Physics*. Medical Physics Publishing.
- Washington, C.M. & Leaver, D.T. (2010). *Principles and Practice of Radiation Therapy*. (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.



## **STAGE TWO PAPERS**

RADT 211	Radiation Therapy Practice II
RADT 212	Principles of Research
RADT 213	Advanced Healthcare Communication
RADT 214	Radiation Technology II
RADT 215	Radiation Therapy and Oncology II
RADT 216	Radiation Therapy Planning Concepts II



## 19. Radiation Therapy Practice II

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<b>Reference Number:</b>	RADT 211
<b>Date:</b>	February 2014
<b>Duration:</b>	640 hours contact and 110 hours independent learning.
<b>Points:</b>	60
<b>Aim:</b>	Consolidation of academic learning in Stage I: the student will gain knowledge and acquire skill to undertake the routine tasks of a radiation therapist, under supervision.
<b>Recommended Entry Level:</b>	Successful completion of all Stage I papers.
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to across three domains: CT/sim, planning and treatment;
	<ol style="list-style-type: none"><li>1. demonstrate knowledge and efficient practice;</li><li>2. recognise patient needs and/or significant changes in patients' condition;</li><li>3. demonstrate appropriate verbal and nonverbal communication skills;</li><li>4. demonstrate the ability to work in a healthcare team;</li><li>5. demonstrate appropriate self-management techniques;</li><li>6. demonstrate safe practices in the workplace;</li><li>7. demonstrate the ability to identify problems in the clinical setting;</li><li>8. develop an increasing awareness of quality assurance;</li><li>9. demonstrate reflective practice.</li></ol>

### Content

#### Corresponding to Learning Outcome 1

- (a) Description of routine radiation therapy practice
- (b) Rationale for routine radiation therapy practice
- (c) Comprehend the practical application of theory and technical skills
- (d) Understand workflow
- (e) Patient safety and comfort

#### Corresponding to Learning Outcome 2

- (a) Physical, social and emotional needs of patients
- (b) Treatment reactions and management, including medication
- (c) Expected response to treatment
- (d) Indicators for reassessing patient condition
- (e) Appropriate referral

**Corresponding to Learning Outcome 3**

- (a) Written records and reports
- (b) Verbal reporting
- (c) Verification of information
- (d) Patient communication
- (e) Staff communication
- (f) Listening skills
- (g) Establishing rapport

**Corresponding to Learning Outcome 4**

- (a) Roles of multi-disciplinary team members
- (b) Channels of communication
- (c) Sources of conflict and dealing with conflict

**Corresponding to Learning Outcome 5**

- (a) Emotional responses RTs may have when working with patients and colleagues
- (b) Appropriate coping strategies
- (c) Time management
- (d) Initiative/responsibility

**Corresponding to Learning Outcome 6**

- (a) Potential hazards and risks
- (b) Safety regulations, procedures and protocols
- (c) Equipment faults

**Corresponding to Learning Outcome 7**

- (a) Identification of problems in the clinical setting

**Corresponding to Learning Outcome 8**

- (a) Quality management systems
- (b) Clinical quality assurance procedures

**Corresponding to Learning Outcome 9**

- (a) Observe, participate in, question and evaluate practice

**Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- clinical practice in Department A;
- tutorials with an emphasis on group discussion;
- seminar, case study, project presentations, journal club, study days and conferences;
- accessing media: journals, texts, newspaper articles and television provide a rich source of material for discussion, exploration;
- utilising a variety of small scale investigative techniques, participation in audit and research culminating in evidence based practice.



### Assessment of Learning Outcomes

Summative assessment will consist of all outcomes within each of the three domains:

- rotational assessment (CT/sim) = Pass/Fail
- rotational assessment (planning) = Pass/Fail
- rotational assessment (treatment) = Pass/Fail

And

- one clinical journal = Pass/Fail

A pass will be awarded to all students who gain a pass in each component.

Students will need to gain 640 clinical hours for the semester in which they have enrolled.

### Reassessment:

- Reassessment can occur in two domains for each enrolment of the paper.
- If a student fails all three domains they are not eligible for reassessment and fail the paper overall.
- Reassessment can occur for the clinical journal.

### Reporting Results to Students

Results will be reported to students as Pass/Fail

**Students will normally be required to retake all assessment components in a repeat enrolment.**

### Resources

Fully equipped and operational radiation therapy department.

#### Textbooks

Bomford, C., Kunkler, I., & Sherriff, S. (2003). *Walter & Miller's Textbook of Radiotherapy*. (6<sup>th</sup> Edition). Churchill Livingstone.

Hass, M.L., Hogle, W.P., Moore-Higgs, G.J. & Gosselin-Acomb, T.K. (2007). *Radiation Therapy: A guide to patient care*. Mosby Elsevier, St Louis.

International Commission on Radiation Units and Measurements: (1993) Prescribing, Recording, and Reporting Photon Beam Therapy. (*ICRU Report 50*)

International Commission on Radiation Units and Measurements; (1999) Prescribing, Recording, and Reporting Photon Beam Therapy. Supplement to ICRU 50 Report (*ICRU Report 62*)

Faithfull, S., & Wells, M. (2003). *Supportive Care in Radiotherapy*. Churchill Livingstone, UK.

Moeller, T.B. & Reif, E. (2006). *Pocket Atlas of Sectional Anatomy, CT and MRI, Vol 1 & Vol 2*. (3<sup>rd</sup> Edition). Thieme, New York.

Rubin, P. (2001). *Clinical Oncology: A multidisciplinary approach for physicians and students*. (8<sup>th</sup> Edition). W.B. Saunders Company, Philadelphia, Pennsylvania.

Washington, C.M., & Leaver, D.T. (2010). *Principles and Practice of Radiation Therapy*. (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.

Webber, E.C., Vilensky, J.A. & Carmichael, S.W. (2009). *Netter's Concise Radiologic Anatomy*. Saunders, an imprint of Elsevier Inc.

## 20. Principles of Research

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<b>Reference Number:</b>	RADT 212
<b>Date:</b>	July 2014
<b>Duration:</b>	25 contact hours and 50 hours of independent learning
<b>Points:</b>	6
<b>Aim:</b>	Student will have a basic understanding of different research methodologies that underpin quantitative and qualitative research.
<b>Recommended Entry Level:</b>	Successful completion of all Stage I papers.
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to: <ol style="list-style-type: none"><li>1. describe the difference between quantitative or qualitative research;</li><li>2. demonstrate a basic understanding of different study designs;</li><li>3. demonstrate a basic understanding of the process involved in obtaining ethical approval for research involving human subjects;</li><li>4. produce a critical analysis of three research papers on a chosen topic.</li></ol>

### Content

#### Corresponding to Learning Outcome 1

- (a) Quantitative versus qualitative research
- (b) Literature reviews versus primary research

#### Corresponding to Learning Outcome 2

- (a) Study designs of quantitative methodologies: cell based studies, animal studies, clinical trials, questionnaire-based studies
- (b) Study designs of qualitative methodologies: questionnaire-based studies: quality of life, focus groups, interviews, ethnographic research, observational research, action based research, critical theory research
- (c) Limitations inherent to different study designs: confounding factors, interpretation of scope of results
- (d) Statistical analyses appropriate for different study designs

#### Corresponding to Learning Outcome 3

- (a) Research ethics
- (b) Participant information sheets and informed consent
- (c) Maori Consultation
- (d) Locality assessment approval

#### Corresponding to Learning Outcome 4

- (a) Description and analysis of three research papers

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper should be achieved by the following:

- Lectures to introduce research concepts and that invite student participation and debate;
- Student centred tutorials with an emphasis on class discussion and debate;
- Workshops by guest speakers who will contribute to the overall research experience from their own unique research background.

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following:

- one assignment (quantitative) = 50% of total mark
- one assignment (qualitative) = 50% of total mark

A pass will be awarded to all students who gain 50% overall.

### **Reporting Results to Students**

Results will be reported to students as:

Coursework out of 100

Student result notices will carry grades from A to E

### **Resources**

Davidson, C. & Tolich, M. (2007). *Social Science Research in New Zealand*. Pearson, Prentice Hall, Australia.

Finlay, L. & Ballinger, C. (2006). *Qualitative Research for Allied Health Professionals: Challenging Choices*. John Wiley & Sons.

Liamputtong, P. (2009). *Qualitative Research Methods*. (3<sup>rd</sup> Edition). Oxford University Press, Australia & New Zealand.

Peat, J. (2001). *Health Science Research. A handbook of quantitative methods*. Allen & Unwin, NSW, Australia.

Polgar, S., & Thomas, S. (2008). *Introduction to Research in the Health Sciences*. (5<sup>th</sup> Edition). Churchill Livingstone.

## 21. Advanced Healthcare Communication

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<b>Reference Number:</b>	RADT 213
<b>Date:</b>	July 2014
<b>Duration:</b>	50 contact hours and 75 hours of independent learning
<b>Points:</b>	10
<b>Aim:</b>	To enable the student to develop effective interpersonal skills when working with patients in pain (curative and palliative) and/or terminally ill.
<b>Recommended Entry Level:</b>	Successful completion of RADT 113: Health and Human Behaviour and RADT 114: Healthcare Communication.
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to:

1. describe factors that may influence an individual's perception of pain, including cancer-related pain (curative and palliative), and relate these to the role of the radiation therapist;
2. identify non-pharmacological methods of pain management and relate these to the role of the radiation therapist;
3. discuss the psychosocial impact of terminal illness on an individual and their family;
4. identify appropriate responses to individuals and their family who are coping with terminal illness;
5. discuss appropriate personal management strategies to lessen the impact on self of working with patients who are in pain and/or terminally ill;
6. discuss the impact of delivering palliative treatment on teams.

### Content

#### Corresponding to Learning Outcome 1

- (a) Causes and classifications of pain
- (b) Basic physiology of pain perception
- (c) Factors that modify pain perception - cultural, social, psychological and physical
- (d) Basic pain assessment in the radiation therapy setting

#### Corresponding to Learning Outcome 2

- (a) Strategies to assist patients cope with pain
  - Physical therapies
  - Psychological and psychosocial methods of pain management

### **Corresponding to Learning Outcome 3**

- (a) Attitudes towards death and dying in self and others
- (b) Psychosocial consequences of terminal illness for the individual and family
- (c) Cross cultural differences in coping with hospitalisation, illness and terminal illness
- (d) Models of grieving, including contextual influences on grief
- (e) Basic grief assessment and intervention

### **Corresponding to Learning Outcome 4**

- (a) Effective communication skills when working with patients, in pain and/or grieving, and their family in the radiation therapy setting
- (b) Counselling as a helping tool
- (c) Cultural competence in palliative context
- (d) Identification of support systems for patient receiving radiation therapy, in pain and/or with palliative intent, and their family

### **Corresponding to Learning Outcome 5**

- (a) Identification of grief responses in self
- (b) Management of self when working with palliative intent
- (c) Strategies to minimise effects on self when working in a palliative context

### **Corresponding to Learning Outcome 6**

- (a) Impact of delivering palliative treatment on teams
- (b) Strategies to promote effective collaboration and participation within teams when treating patients with palliative intent

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- student centred tutorials with an emphasis on class discussion and debate;
- guest speakers who are able to offer current and practical information on topics;
- case studies and problem based learning;
- simulated clinical scenarios with the lecturer, actors and others modelling and coaching appropriate behaviours;
- seminar and project presentations;
- the use of media such as videos, journals, texts, newspaper articles and television will provide a rich source of material for discussion, exploration and debate;
- use of a variety of small scale investigative techniques;
- the teaching material should draw on the student's personal and professional experiences and encourage critical inquiry and examination of the "taken for granted world".

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following :

- one case study = 40% of total mark
- one assignment = 30% of total mark
- one assignment = 30% of total mark

A pass will be awarded to all students who gain 50% overall.

## Reporting Results to Students

Results will be reported to students as follows:

Coursework out of 100

Student result notices will carry grades from A to E

## Resources

- Andrews, M.M. & Boyle, J.S. (2003). *Transcultural concepts in nursing care*. Philadelphia: Lippincott Williams & Wilkins.
- Aranda, S., & O'Connor, M.M. (2003). *Palliative care nursing: a guide to practice*. Melbourne: Ausmed Publications.
- Berger, A.M., Shuster, J.L., & von Roenn, J.H. (Eds.). (2007). *Principles and practice of palliative care and supportive oncology*. Philadelphia: Lippincott Williams & Wilkins.
- Berglund, C. (2004). *Ethics for health care*. (2<sup>nd</sup> Edition). Melbourne. Oxford University Press.
- Bruera, E.D., & Portenoy, R.K. (2003). *Cancer pain: assessment and management*. Cambridge: Cambridge University Press.
- Doka, K.J. (Ed.). (2007). *Living with grief: before and after the death*. Washington, D.C.: Hospice Foundation of America.
- Ferrell, B.R., & Coyle, N. (Eds.). (2001). *Textbook of palliative nursing*. Oxford; Oxford University Press.
- Gatenby, B.I. (1998). *For the rest of our lives: after the death of a child*. Auckland: Reed.
- Klass, D., Silverman, P.R., & Nickman, S.L. (1998). *Continuing bonds: new understandings of grief*. Washington DC: Taylor and Francis.
- Kubler-Ross, L. (1969). *On Death and Dying*. New York: Macmillan.
- Lloyd-Williams, M. (2003). *Psychosocial issues in palliative care*. Oxford: Oxford University Press.
- Main, C.J., & Spanswick, C.C. (Eds.). (2000). *Pain Management: An interdisciplinary approach*. Edinburgh: Harcourt Publishes Ltd.
- Ministry of Health (2001). *The New Zealand Palliative Care Strategy*. Wellington: Ministry of Health.
- Neimeyer, R.A. (Ed.). (2002). *Meaning reconstruction and the experience of loss*. (2<sup>nd</sup> Edition). Washington DC; American Psychological Association.
- Neuberger, J. (2004). *Dying well: a guide to enabling a good death*. Oxford: Radcliffe.
- Northouse, L.L., & Northouse, P.G. (1998). *Health communication*. (3<sup>rd</sup> Edition). Appleton & Hall, USA.
- Skevington, S. (1995). *Psychology of pain*. Chichester: Wiley.
- Stroebe, M. S. (2001). *Handbook of bereavement research: consequences, coping, and care*. Washington, D.C.: American Psychological Association.
- Strong, J. (Ed.). (2002). *Pain: a textbook for therapists*. Edinburgh: Churchill Livingstone.
- Victoria Hospice Society, Cairns, M., Thompson, M., & Wainwright, W. (2003). *Transitions in dying and bereavement: a psychosocial guide for hospice and palliative care*. Baltimore: Health Professions Press.
- Walsh-Burke, K. (2006). *Grief and loss: theories and skills for helping professionals*. Boston: Pearson Allyn & Bacon.
- Weiten, W. (2004). *Psychology: Themes and Variations*. (6<sup>th</sup> Edition). Brooks Cole.
- Worden, J. (2002). *Grief Counselling and Grief Therapy*. (3<sup>rd</sup> Edition). A Handbook for the Mental Health Practitioner. Springer, New York.

## 22. Radiation Technology II

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<b>Reference Number:</b>	RADT 214
<b>Date:</b>	July 2014
<b>Points:</b>	16
<b>Duration:</b>	100 contact and 100 hours of independent learning
<b>Aim:</b>	To enable students to apply their understanding of computers, radiation therapy equipment and imaging to the planning and delivery of radiation therapy.
<b>Recommended Entry Level:</b>	Successful completion of RADT 115: Radiation Technology I.
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to:

1. describe the role of the different types of radiation for use in radiation therapy;
2. describe the process for machine calibration and quality control;
3. describe radiation detection and measurement;
4. discuss quality assurance systems in radiation therapy;
5. discuss treatment and imaging technology in radiation therapy;
6. discuss the use of radioactive materials in radiation therapy.

### Content

#### Corresponding to Learning Outcome 1

- (a) Photons – absorption processes
- (b) Electrons – absorption in tissue, depth doses, isodoses
- (c) Other particles, principally protons

#### Corresponding to Learning Outcome 2

- (a) Radiation detectors and calibration
- (b) Machine calibration

#### Corresponding to Learning Outcome 3

- (a) Radiation detectors for use in phantoms and on patients
- (b) Radiation measurement

#### Corresponding to Learning Outcome 4

- (a) Principles of quality assurance
- (b) Systems of quality assurance
- (c) Rationale for quality assurance

### **Corresponding to Learning Outcome 5**

- (a) Imaging techniques: CBCT, OBI, CT, PET
- (b) IMRT and tomography
- (c) IGRT and Adaptive RT
- (d) Stereotactic techniques

### **Corresponding to Learning Outcome 6**

- (a) Distinguish between sealed and unsealed sources
- (b) Brachytherapy loading techniques and delivery systems
- (c) Unsealed therapy procedures
- (d) Safety and quality assurance

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- lectures
- student centred tutorials
- laboratory demonstrations and practical sessions

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following :

- one assignment = 20% of total mark
- one test = 20% of total mark
- one test = 20% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to take the final examination. A pass will be awarded to all students who gain a minimum of 50% in the examination and 50% overall.

### **Reporting Results to Students**

Results will be reported to students as follows:

Coursework	60
Final examination	40
TOTAL	100

Student result notices will carry grades from A to E

### **Resources**

#### **Electronic Media**

European Society for Therapeutic Radiography and Oncology (ESTRO) <http://www.estro.org>

American Association of Physicists in Medicine (AAPM) <http://www.aapm.org/>

International Atomic Energy Agency (IAEA) <http://www.iaea.org/>

Varian Medical Systems <http://www.varian.com/>

Elekta <http://www.elekta.com/>

GE Healthcare <http://www.gehealthcare.com>

US National Cancer Institute <http://www.cancer.gov/>

Siemens Medical <http://www.medical.siemens.com>



## Textbooks

- Ball, J., & Moore, A. (1997) *Essential Physics for Radiographers*. Blackwell Scientific.
- Bomford, C.K. & Kunkler, I.H. (2003) *Walter and Miller's textbook of radiotherapy : radiation, physics, therapy and oncology*. (6th ed.) Edinburgh, Churchill Livingstone.
- Bushong, S C. (2001) *Radiologic science for technologists : physics, biology, and protection*. St. Louis : Mosby.
- Bushberg, J. T. (2002) *The essential physics of medical imaging*. Philadelphia, Pa.; London : Lippincott Williams & Wilkins.
- Graham, D.T., Cloke, P. & Vosper, M. (2007). *Principles of Radiological Physics*. (5<sup>th</sup> Edition). Churchill Livingstone.
- Guy, G. & Ffytche, D. (2005) *An introduction to the principles of medical imaging*. London : Imperial College Press.
- Hendee, W. & Ritenour R. (2002). *Medical imaging physics*. New York ; Chichester : Wiley-Liss.
- Hazle, J D. & others (1998) *Imaging in radiation therapy : American Association of Physicists in Medicine 1998 Summer School proceedings*, University of Wisconsin, Madison, Wisconsin.. Madison, WI : Published for the American Association of Physicists in Medicine by Medical Physics Pub.
- Khan, F. (2003). *The Physics of Radiation Therapy*. (3<sup>rd</sup> Edition). Williams and Wilkins, Baltimore.
- Morris, S. (2001). *Radiotherapy physics and equipment*. Churchill Livingstone.
- Podgorsak, E.B., ed. (2005) *Radiation Oncology Physics: A Handbook For Teachers And Students* International Atomic Energy Agency Vienna, 2005
- Purdy, J A. (2001) *3-D conformal and intensity modulated radiation therapy : physics & clinical applications*. Madison, WI, U.S.A. Advanced Medical Pub.
- Washington, C.M., & Leaver, D.T. (2010) *Principles and Practice of Radiation Therapy*. (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.

## 23. Radiation Therapy and Oncology II

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<b>Reference Number:</b>	RADT 215
<b>Date:</b>	July 2014
<b>Duration:</b>	60 contact and 65 hours of independent learning
<b>Points:</b>	10
<b>Aim:</b>	To enable the student to integrate their knowledge of oncology and treatment modalities to determine optimal treatment for malignant disease.
<b>Recommended Entry Level:</b>	Successful completion of RADT 116: Radiation Therapy and Oncology I.
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to: <ol style="list-style-type: none"><li>1. discuss the oncology of and the clinical rationale for selecting appropriate treatment for the stated 'Site List' (tumours that are commonly treated clinically);</li><li>2. discuss the implications of the Cartwright Inquiry.</li></ol>

### Content

#### Corresponding to Learning Outcome 1

##### Site List

- skin (SCC, BCC, melanoma)
  - urogenital (bladder, testes, prostate)
  - gynaecological (cervix, endometrium, ovary)
  - gastrointestinal (oesophagus & rectum)
  - head & neck (pituitary & larynx)
- (a) Patient assessment methods
  - (b) Tumour pathology and characteristics
  - (c) Combined modality treatments with a focus on radiation therapy techniques (including palliation)
  - (d) Typical treatment reactions

#### Corresponding to Learning Outcome 2

- (a) Ethical issues highlighted by the Cartwright Report
- (b) Recommended investigations for cervical cancer
- (c) Significance of the Cartwright Inquiry

## Suggested Learning and Teaching Approaches

The learning outcomes of this paper could be achieved by the following:

- student centred tutorials with an emphasis on class discussion and debate;
- seminar and project presentations;
- the use of media such as videos, journals, texts, newspaper articles and television will provide a rich source of material for discussion, and exploration.

## Assessment of Learning Outcomes

Summative assessment will consist of the following :

- one group presentation = 30% of total mark
- one test = 30% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to take the final examination. A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

## Reporting Results to Students

Results will be reported to students as follows:

Coursework out of	60
Final examination out of	40
TOTAL	100

Student result notices will carry grades from A to E

## Resources

### Electronic Media

Students have access to a variety of data bases and CD Roms

### Textbooks

*A Guide to Palliative Care in New Zealand.* (2nd Edition). Douglas Pharmaceuticals 1992.

Baird, S. (1991). *A Cancer Source Book for Nurses.* (6th Edition). American Cancer Society.

*Blackburns Introduction to Clinical Radiation Therapy.* (1989) Medical Physics Publishing Co-Op, Madison

Bomford, C.K. & Kunkler, I.H. (2003). *Walter & Miller's textbook of radiotherapy: radiation, physics, therapy and oncology.* (6<sup>th</sup> Edition). Churchill Livingstone.

Bryant, B., & Knights K. (2007). *Pharmacology for Health Professionals* (2<sup>nd</sup> Edition). Mosby Elsevier, Sydney

*Clinical Pharmacology made Incredibly Easy* (2<sup>nd</sup> Edition) Lippincott Williams and Wilkins 2003

Faithfull, S., & Wells, M. (2003). *Supportive Care in Radiotherapy* Churchill Livingstone, Edinburgh

Hass, M.L., Hogle, W.P., Moore-Higgs, G.J. & Gosselin-Acomb, T.K. (2007). *Radiation Therapy: A guide to patient care.* Mosby Elsevier, St Louis.

International Commission on Radiation Units and Measurements: (1993) Prescribing, Recording, and Reporting Photon Beam Therapy. (*ICRU Report 50*)

International Commission on Radiation Units and Measurements: (1999) Prescribing, Recording, and Reporting Photon Beam Therapy. Supplement to ICRU 50 (*ICRU Report 62*).

Moller, T.B. & Reif, E. (2006). *Pocket Atlas of Sectional Anatomy, CT and MRI, Vol 1 & Vol 2.* (3<sup>rd</sup> Edition). Thieme, New York.

- Neal, A. & Hoskin, P. (2003). *Clinical Oncology - Basic Principles and Practice*. (3<sup>rd</sup> Edition). Edward Arnold.
- Ruben, P. (2001). *Clinical Oncology: A multidisciplinary approach for physicians and students*. (8<sup>th</sup> Edition). W.B. Saunders Company, Philadelphia, Pennsylvania.
- Tortora, G.J. & Derrickson, B. (2009). *Principles of Anatomy and Physiology*. (12<sup>th</sup> Edition). John Wiley & Sons.
- Washington, C.M. & Leaver, D.T. (2010). *Principles and Practice of Radiation Therapy*. (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.
- Webber, E.C., Vilensky, J.A. & Carmichael, S.W. (2009). *Netter's Concise Radiologic Anatomy*. Saunders, an imprint of Elsevier Inc.

## 24. Radiation Therapy Planning Concepts II

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<b>Reference Number:</b>	RADT 216
<b>Date:</b>	July 2014
<b>Duration:</b>	100 Contact and 125 hours of independent learning
<b>Points:</b>	18
<b>Aim:</b>	To enable students to understand the concepts of radiation therapy treatment planning to enable the planning of standard techniques
<b>Recommended Entry Level:</b>	Successful completion of RADT 116: Radiation Therapy & Oncology I and RADT 117: Radiation Therapy Planning Concepts I.
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to: <ol style="list-style-type: none"><li>1. demonstrate knowledge and application of calculations used in radiation therapy;</li><li>2. demonstrate knowledge, application of principles and concepts of computer planning for critiquing standard techniques;</li><li>3. demonstrate an understanding of imaging and anatomy, relevant to computer planning;</li><li>4. discuss the effects of radiation on biological systems.</li></ol>

### Content

#### Corresponding to Learning Outcome 1

- (a) Calibration conditions
- (b) Inverse square law
- (c) Attenuation factors for SSD and SAD techniques
- (d) Manual calculations of radiation therapy SSD and SAD treatment techniques including shielding and extended SSD
- (e) Justification of factors used and resulting MU

#### Corresponding to Learning Outcome 2

- (a) Consolidate knowledge of computer planning principles by producing a range of standard radiation therapy plans. Principles to include:
  - isodose distributions
  - ICRU 50/62
  - normalisation
  - weighting
  - beam energy, d-max, exit dose and arrangement
  - inhomogeneities

- wedges
- monitor units
- field verification
- organs at risk
- contouring methods
- volume transfer

- (b) Apply computer planning principles by students critiquing the plans produced

### **Corresponding to Learning Outcome 3**

- (a) Applied anatomy and imaging
- (b) Diagnostic imaging e.g. CT, SPECT, PET, MRI
- (c) Image fusion

### **Corresponding to Learning Outcome 4**

- (a) Radiation chemistry
- (b) Mammalian cell sensitivity
- (c) Physical modification of radiation exposure
- (d) Acute radiation syndrome
- (e) Late effects of radiation

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- practical laboratory tutorials for computer planning;
- student centred tutorials with an emphasis on class discussion and debate;
- the use of media such as videos, journals, and texts, will provide a rich source of material for discussion, and exploration.

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following:

- one assignment (dosim/calcs/imaging) = 40%
- one test (radiobiology) = 20%
- one VIVA (60% pass mark) = 40%

One reassessment can occur if the pass mark of 60% is not achieved in the viva.

A pass will be awarded to all students who gain 50% overall.

### **Reporting Results to Students**

Results will be reported to students as follows:

Coursework out of 100

Student result notices will carry grades from A to E

### **Resources**

Eclipse Planning System

## Textbooks

- Ball, J., & Moore, A. (1997) *Essential Physics for Radiographers*. Blackwell Scientific.
- Bomford, C.K. & Kunkler, I.H. (2003) *Walter and Miller's textbook of radiotherapy : radiation, physics, therapy and oncology*. (6th ed.) Edinburgh, Churchill Livingstone.
- Bushberg, J. T. (2002) *The essential physics of medical imaging*. Philadelphia, Pa.; London : Lippincott Williams & Wilkins.
- Giancoli, D.C. (2005). *Physics - Principles with Applications*. (6<sup>th</sup> Edition). Prentice Hall, USA.
- Greene, D & Williams, P. (1997) *Linear accelerators for radiation therapy* Institute of Physics Publishing
- Hass, M.L., Hogle, W.P., Moore-Higgs, G.J. & Gosselin-Acomb, T.K. (2007). *Radiation Therapy: A guide to patient care*. Mosby Elsevier, St Louis.
- Hendee, W. & Ritenour R. (2002). *Medical imaging physics*. New York ; Chichester : Wiley-Liss,
- International Commission on Radiation Units and Measurements: (1993) Prescribing, Recording, and Reporting Photon Beam Therapy. (*ICRU Report 50*)
- International Commission on Radiation Units and Measurements: (1999) Prescribing, Recording, and Reporting Photon Beam Therapy. Supplement to ICRU 50 (*ICRU Report 62*).
- Khan, F. (2003). *The Physics of Radiation Therapy*. (3<sup>rd</sup> Edition). Williams and Wilkins, Baltimore.
- Moller, T.B. & Reif, E. (2006). *Pocket Atlas of Sectional Anatomy, CT and MRI, Vol 1 & Vol 2*. (3<sup>rd</sup> Edition). Thieme, New York.
- Morris, S. (2001). *Radiotherapy physics and equipment*. Churchill Livingstone.
- Purdy, J A. (2001) *3-D conformal and intensity modulated radiation therapy : physics & clinical applications*. Madison, WI, U.S.A. Advanced Medical Pub.
- Stanton, R., & Stinton, D. (1992). *An Introduction to Radiation Oncology Physics*. Medical Physics Publishing.
- Washington, C.M. & Leaver, D.T. (2010). *Principles and Practice of Radiation Therapy*. (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.
- Webber, E.C., Vilensky, J.A. & Carmichael, S.W. (2009). *Netter's Concise Radiologic Anatomy*. Saunders, an imprint of Elsevier Inc.





## **STAGE THREE PAPERS**

RADT 311	Radiation Therapy Practice III
RADT 312	Literature Analysis
RADT 313	Professional Development
RADT 314	Radiation Therapy and Oncology III
RADT 315:	Radiation Therapy Planning Concepts III



## 25. Radiation Therapy Practice III

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<b>Reference Number :</b>	RADT 311
<b>Date:</b>	July 2014
<b>Duration:</b>	640 contact hours and 110 hours of independent learning.
<b>Points:</b>	60
<b>Aim:</b>	To enable the student to demonstrate the ability to effectively carry out the duties of a radiation therapist, taking responsibility for his/her actions, under the supervision of a qualified radiation therapist.
<b>Recommended Entry Level:</b>	Successful completion of RADT 312, 313, 314 and 315.
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to across three domains: CT/sim, planning and treatment;  <ol style="list-style-type: none"><li>1. demonstrate consistent and safe practice</li><li>2. demonstrate understanding of quality assurance procedures;</li><li>3. demonstrate the ability to identify error and problem solving skills;</li><li>4. demonstrate consistent and optimal patient care: assessment, advice and managing patient needs;</li><li>5. demonstrate well developed communication skills;</li><li>6. demonstrate reflective practice and utilise coping strategies in the context of illness, grief, death and dying.</li></ol>

### **Content**

#### **Corresponding to Learning Outcome 1**

- (a) Description and rationale of routine radiation therapy practice
- (b) Demonstrate consistent routine radiation therapy practice (including technical competence)

#### **Corresponding to Learning Outcome 2**

- (a) Demonstrate safe practice
- (b) Demonstrate quality assurance practices in the clinical setting

#### **Corresponding to Learning Outcome 3**

- (a) Identification of problems/error in clinical setting
- (b) Demonstrate problem solving techniques in clinical setting
- (c) Evaluation of problem solving outcomes

#### **Corresponding to Learning Outcome 4**

- (a) Recognise patient needs and/or significant change in patient condition
- (b) Assess, advise and manage patient needs
- (c) Communicate information accurately and effectively

#### **Corresponding to Learning Outcome 5**

- (a) Written records and reports
- (b) Verification of information
- (c) Verbal and non-verbal communication skills
- (d) Works professionally with appropriate demeanour
- (e) Teamwork, including multidisciplinary healthcare team

#### **Corresponding to Learning Outcome 6**

- (a) High level of self awareness
- (b) Ability to recognise critical incidents
- (c) Effective coping strategies

#### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- clinical practice in Department B;
- tutorials with an emphasis on group discussion;
- seminar, case study project presentations, journal club, study days and conferences;
- accessing media: journals, texts, newspaper articles and television provide a rich source of material or discussion, exploration;
- utilisation of a variety of small scale investigative techniques, involvement in audit and research culminating in evidence based practice

#### **Assessment of Learning Outcomes**

Summative assessment will consist of all outcomes within each domain:

- |                          |   |           |
|--------------------------|---|-----------|
| • assessment (CT/sim)    | = | Pass/Fail |
| • assessment (planning)  | = | Pass/Fail |
| • assessment (treatment) | = | Pass/Fail |

A pass will be awarded to all students who gain a pass in each domain.

#### **Reassessment:**

- Reassessment can occur in two domains for each enrolment of the paper.
- If a student fails all three domains they are not eligible for reassessment and fail the paper overall.

#### **Reporting Results to Students**

Results will be reported to students as Pass/Fail

**Students will normally be required to retake all assessment components in a repeat enrolment**

## Resources

Fully equipped and operational radiation therapy department.

### Textbooks

Bomford, C., & Kunkler, I. (2003). *Walter & Miller's Textbook of Radiotherapy*. (6<sup>th</sup> Edition) Churchill Livingstone.

Dobbs, J., Barrett, A., & Ash, D. (1999). *Practical Radiotherapy Planning*. (3<sup>rd</sup> Edition). Edward Arnold, London.

Faithfull, S., & Wells, M. (2003). *Supportive Care in Radiotherapy*. Churchill Livingstone, UK.

International Commission on Radiation Units and Measurements: (1993) Prescribing, Recording, and Reporting Photon Beam Therapy. (*ICRU Report 50*)

International Commission on Radiation Units and Measurements: (1999) Prescribing, Recording, and Reporting Photon Beam Therapy. Supplement to ICRU 50 Report (*ICRU Report 62*).

Khan, F.M., & Potish, R.A. (1998). *Treatment Planning in Radiation Oncology*. Williams and Wilkins. Baltimore.

Rubin, P. (2001). *Clinical Oncology: A multidisciplinary approach for physicians and students*. (8<sup>th</sup> Edition). W.B. Saunders Company, Philadelphia, Pennsylvania.

Washington, C.M., & Leaver, D.T. (2010). *Principles and Practice of Radiation Therapy*. (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.

## 26. Literature Analysis

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<b>Reference Number :</b>	RADT 312
<b>Date:</b>	February 2014
<b>Duration:</b>	50 contact hours and 200 hours of independent learning
<b>Points:</b>	20
<b>Aim:</b>	For students to critically analyse and report on two sets of journal articles (quantitative and qualitative methodologies) of their own choice within the radiation therapy setting.
<b>Recommended Entry Level:</b>	Satisfactory completion of RADT 212: Principles of Research
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to;
	<ol style="list-style-type: none"><li>1. competently analyse and report on three (3) primary research papers that use quantitative methodologies</li><li>2. competently analyse and report on three (3) primary research papers that use qualitative methodologies</li><li>3. present the outcomes of the studies in an oral or poster format</li></ol>

### **Content**

#### **Corresponding to Learning Outcome 1**

- (a) Critical analysis of three papers that explore a chosen area of quantitative research
- (b) Understanding of research design, including ethical considerations

#### **Corresponding to Learning Outcome 2**

- (a) Critical analysis of three papers that explore a chosen area of qualitative research
- (b) Understanding of research design, including ethical considerations

#### **Corresponding to Learning Outcome 3**

- (a) Presentation of the outcomes of one of the studies in the form of an oral presentation and the other in the form of a poster.

## **Suggested learning and Teaching Approaches**

Student centred tutorials

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following:

- quantitative assignment 40%
- qualitative assignment 40%
- poster discussion 20%

A pass will be awarded to all students who gain 50% overall.

### **Reporting Results to Students**

Results will be reported to students as follows:

Coursework out of 100

Student result notices will carry grades from A to E

### **Resources**

Davidson, C. & Tolich, M. (2007). *Social Science Research in New Zealand*. Pearson, Prentice Hall, Australia.

Liamputtong, P. (2009). *Qualitative Research Methods*. (3<sup>rd</sup> Edition). Oxford University Press, Australia & New Zealand.

Liamputtong, P. (2010). (Ed.). *Research methods in health: Foundations for evidence-based practice*. Oxford University Press, Melbourne.

Peat, J. (2001). *Health Science Research. A handbook of quantitative methods*. Allen & Unwin, NSW, Australia.

Polgar, S., & Thomas, S. (2008). *Introduction to Research in the Health Sciences*. (5<sup>th</sup> Edition).

## 27. Professional Development

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<b>Reference Number :</b>	RADT 313
<b>Date :</b>	February 2014
<b>Duration :</b>	60 contact and 65 hours of independent learning
<b>Points :</b>	10
<b>Aim :</b>	For students to develop their own knowledge and skills and to demonstrate personal, people and organisational development.
<b>Recommended Entry Level :</b>	Successful completion of RADT 213: Advanced Healthcare Communication
<b>Learning Outcomes :</b>	On completion of this paper the successful student will be able to:

1. determine a personally and professionally acceptable vision of the role of a radiation therapist and be able to integrate this professional role into other life roles.
2. identify own role and responsibilities within radiation therapy teams.
3. demonstrate conflict resolution strategies appropriate to the radiation therapy context.
4. describe appropriate strategies to minimise the development of burnout in the workplace.
5. demonstrate the skills of reflective practice as part of ongoing professional development.
6. consider issues relevant to future career planning.
7. identify own learning needs and how to fulfil these needs.
8. identify the structure and functions of the health care system in New Zealand and the role of radiation therapy within the health care system.

### Content

#### Corresponding to Learning Outcome 1

- (a) Professional socialisation
- (b) Radiation therapists as members of a profession - roles and responsibilities
- (c) Professional values and ethical practice
- (d) Problem solving within a moral/ethical and medico-legal framework
- (e) Moral dimensions of the role of the radiation therapist



**Corresponding to Learning Outcome 2**

- (a) Structure of radiation therapy teams
- (b) Team dynamics
- (c) Communication and teamwork
- (d) Working in multi-disciplinary teams

**Corresponding to Learning Outcome 3**

- (a) Common sources of conflict in healthcare
- (b) Strategies for dealing with conflict
- (c) Personal management strategies

**Corresponding to Learning Outcome 4**

- (a) Origins and types of stressors
- (b) Consequences of stress: cognitive, emotional, physical, behavioural
- (c) Positive and negative coping mechanisms
- (d) Strategies to prevent or minimise the effects of stress
- (e) Causes and consequences of burnout in a health care setting
- (f) Strategies for dealing with burnout

**Corresponding to Learning Outcome 5**

- (a) Reflective practice and novice practitioners
- (b) Processes of critical reflective practice
- (c) Supervision, other supports and debriefing

**Corresponding to Learning Outcome 6**

- (a) Issues relevant to future professional development and career planning
- (b) CV's, letters of application
- (c) Interview skills

**Corresponding to Learning Outcome 7**

- (a) Maintenance of professional standards
- (b) Lifelong learning and continuing professional development

**Corresponding to Learning Outcome 8**

- (a) Structure of the New Zealand health care system, historical and current
- (b) Cancer Control Strategy and the role of radiation therapy in the New Zealand health care system
- (c) Medico-legal dimensions of the role of the radiation therapist and moral agency (to include HDC and HPCA)
- (d) Codes of ethics and the radiation therapist
- (e) New Zealand Institute of Medical Radiation Technology
- (f) Medical Radiation Technologists Board
- (g) Interprofessional education

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following :

- student centred tutorials with an emphasis on class discussion and debate;
- seminar and project presentations;
- the use of media such as videos, journals, texts, newspaper articles and television will provide a rich source of material for discussion, and exploration;
- use of current research in scholarly journals
- simulated clinical scenarios with the lecturer, actors and others modelling and coaching appropriate behaviours.

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following :

- one assignment (ethics) = 50% of total mark
- one assignment (professional issues) = 50% of total mark

A pass will be awarded to all students who gain 50% overall.

### **Reporting Results to Students**

Results will be reported to students as follows:

Coursework out of 100

Student result notices will carry grades from A to E

### **Resources**

#### **Electronic Media**

Students have access to a variety of data bases and CD Roms

Ministry of Health reports: [www.moh.govt.nz](http://www.moh.govt.nz)

- New Zealand Cancer Control Strategy (2003)
- New Zealand Cancer Control Strategy Action Plan: 2005-2010 (2005)
- Cancer Control Workforce Stocktake and Needs Assessment (2007)
- Cancer in New Zealand: Trends and Projections (2002).
- He Ritenga Whakaaro: Maori Experiences of Health Services (2009)
- Health Professionals Competency Assurance Act (2003)
- Healthcare Workforce Development: An Overview (2006)
- Improving Non-Surgical Cancer Treatment Services in New Zealand (2001)
- New Zealand Health Strategy (2000)
- New Zealand Palliative Care Strategy (2001)
- Pacific Cultural Competences (2008)
- Reducing Inequalities in Health (2002)
- Reportable Events: Guidelines (2001)
- Review of Health Practitioners Competence Assurance Act (2009)

#### **Recommended Reading**

Berglund, C. *Ethics for health care*. 3<sup>rd</sup> Ed. Melbourne: Oxford University Press.

Bolles, R. (2009). *What colour is your parachute?* Ten Speed Press.

- Borkowski, N. (Ed.). (2005). *Organisational behaviour in health care*. Sudbury, Mass.: Jones and Bartlett Publishers.
- Bulman, C. and Schutz, S. (Eds.). (2008). *Reflective practice in nursing*. Oxford: Blackwell.
- Fry, S.T., & Johnstone, M.J. (2002). *Ethics in nursing practice: a guide to ethical decision making*. (2<sup>nd</sup> Edition). Blackwell Science.
- Linsley, P. (2006). *Violence and aggression in the workplace: a practical guide for all healthcare staff*. Abingdon: Radcliffe.
- Miller, K. (2009). *Organisational communication: approaches and processes*. Boston, Mass: Wadsworth Centage Learning.
- Runciman, B., Merry, A., and Walton, M. (2007). *Safety and ethics in healthcare: a guide to getting it right*. Aldershot, England: Ashgate.
- Pitts, J. (2007). *Portfolios, personal development and reflective practice*. Edinburgh: ASME.
- Skovholt, T.M. (2000). *The resilient practitioner: Burnout prevention and self-care strategies for counsellors, therapists, teachers and health professionals*. Pearson: Allyn & Bacon.
- Taylor, B.J. (2006). *Reflective practice: a guide for nurses and midwives*. Buckingham: Open University Press.
- Wicks, R.J. (2005). *Overcoming secondary stress in medical and nursing practice: a guide to professional resilience and personal well-being*. New York: Oxford University Press.
- Wicks, R.J. (2007). *The Resilient Clinician*. Oxford: Oxford University Press, USA.
- Wilson, P. (1999). *Calm at work*. Penguin Putnam, NY.

## 28. Radiation Therapy and Oncology III

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<b>Reference Number :</b>	RADT 314
<b>Date:</b>	February 2014
<b>Duration:</b>	75 Contact and 75 independent learning hours
<b>Points:</b>	12
<b>Aim:</b>	To enable the student to integrate their knowledge of oncology and treatment modalities to determine optimal treatment for malignant disease and to understand the implications of resource management.
<b>Recommended Entry Level:</b>	Successful completion of RADT 215: Radiation Therapy and Oncology II.
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to: <ol style="list-style-type: none"><li>1. discuss the oncology of and the clinical rationale for selecting appropriate treatment for the stated 'Site List'(tumours that are commonly treated clinically);</li><li>2. analyse the resource implications of managing an oncology department.</li></ol>

### Content

#### Corresponding to Learning Outcome 1

##### Site List

- breast
  - lung
  - head & neck (oral cavity, pharynx, parotid)
  - CNS (astrocytoma/medulloblastoma)
  - lymphoma (Hodgkins and non-Hodgkins lymphomas)
  - sarcomas
  - paediatrics
- (a) Patient assessment methods
  - (b) Tumour pathology and characteristics
  - (c) Combined modality treatments with a focus on radiation therapy techniques (including palliation)
  - (d) Typical treatment reactions and the appropriate management of these

## Corresponding to Learning Outcome 2

- (a) Human resource management
- (b) Financial resource management
- (c) Time management
- (d) Equipment/plant/stock/management
- (e) Use of statistics in management

## Suggested Learning and Teaching Approaches

The learning outcomes of this paper could be achieved by the following:

- student centred tutorials with an emphasis on class discussion and debate;
- seminar and project presentations;
- the use of media such as videos, journals, texts, newspaper articles and television will provide a rich source of material for discussion, and exploration.

## Assessment of Learning Outcomes

Summative assessment will consist of the following :

- one test = 30% of total mark
- one assignment = 30% of total mark
- one final 2 hour written examination = 40% of total mark

50% must be gained in the coursework to be eligible to take the final examination. A pass will be awarded to all students who gain 50% minimum in the examination and 50% overall.

## Reporting Results to Students

Results will be reported to students as follows:

Coursework	60
Final examination	40
TOTAL	100

Student result notices will carry grades from A to E

## Resources

### Electronic Media

Students have access to a variety of data bases and CD Roms

### Textbooks

*A Guide to Palliative Care in New Zealand.* (2nd Edition). Douglas Pharmaceuticals 1992.

Baird, S. (1991). *A Cancer Source Book for Nurses.* (6th Edition). American Cancer Society.

*Blackburns Introduction to Clinical Radiation Therapy.* (1989) Medical Physics Publishing Co-Op, Madison

Bomford, C.K. & Kunkler, I.H. (2003). *Walter & Miller's textbook of radiotherapy: radiation, physics, therapy and oncology.* (6<sup>th</sup> Edition). Churchill Livingstone.

Bryant, B., & Knights K. (2007). *Pharmacology for Health Professionals* (2<sup>nd</sup> Edition). Mosby Elsevier, Sydney

*Clinical Pharmacology made Incredibly Easy* (2<sup>nd</sup> Edition) Lippincott Williams and Wilkins 2003

- Faithfull, S., & Wells, M. (2003). *Supportive Care in Radiotherapy* Churchill Livingstone, Edinburgh
- Hass, M.L., Hogle, W.P., Moore-Higgs, G.J. & Gosselin-Acomb, T.K. (2007). *Radiation Therapy: A guide to patient care*. Mosby Elsevier, St Louis.
- International Commission on Radiation Units and Measurements: (1993) Prescribing, Recording, and Reporting Photon Beam Therapy. (*ICRU Report 50*)
- International Commission on Radiation Units and Measurements: (1999) Prescribing, Recording, and Reporting Photon Beam Therapy. Supplement to ICRU 50 (*ICRU Report 62*).
- Moller, T.B. & Reif, E. (2006). *Pocket Atlas of Sectional Anatomy, CT and MRI, Vol 1 & Vol 2*. (3<sup>rd</sup> Edition). Thieme, New York.
- Neal, A. & Hoskin, P. (2003). *Clinical Oncology - Basic Principles and Practice*. (3<sup>rd</sup> Edition). Edward Arnold.
- Washington, C.M. & Leaver, D.T. (2010). *Principles and Practice of Radiation Therapy*. (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.

## 29. Radiation Therapy Planning Concepts III

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<b>Reference Number :</b>	RADT 315
<b>Date:</b>	February 2014
<b>Duration:</b>	100 Contact and 125 independent learning hours
<b>Points:</b>	18
<b>Aim:</b>	To enable students to understand the concepts of radiation therapy treatment planning to plan a range of techniques
<b>Recommended Entry Level:</b>	Successful completion of RADT 215: Radiation Therapy and Oncology II and RADT 216: Radiation Therapy Planning Concepts I.
<b>Learning Outcomes:</b>	On completion of this paper the successful student will be able to demonstrate: <ol style="list-style-type: none"><li>1. knowledge and application of calculations used in radiation therapy;</li><li>2. knowledge and performance of principles and concepts of computer planning, and the ability to critically analyse standard radiation therapy technique computer plans</li><li>3. consolidation of imaging and anatomy relevant to radiation therapy</li><li>4. application of radiobiology to the clinical setting</li></ol>

### Content

#### Corresponding to Learning Outcome 1

- (a) Calibration conditions
- (b) Inverse square law
- (c) Attenuation factors for SSD and SAD techniques
- (d) Manual calculations of basic radiation therapy SSD and SAD treatment techniques including shielding and extended SSD
- (e) Justification and understanding of factors used and resulting MU

#### Corresponding to Learning Outcome 2

- (a) Apply computer planning principles and concepts to produce a range of plans of moderate difficulty. Principles to include:
  - isodose distributions
  - ICRU 50/62
  - normalisation
  - weighting
  - beam energy, d-max, exit dose and arrangement
  - beam arrangement

- inhomogeneities
  - wedges
  - monitor units
  - field verification
  - organs at risk
  - diagnostic imaging
- (a) Apply computer planning principles and concepts to critique standard radiation therapy technique computer plans

### **Corresponding to Learning Outcome 3**

- (a) Applied Anatomy
- (b) Cone beam and kV imaging
- (c) Application of CT, SPECT, PET, MRI

### **Corresponding to Learning Outcome 4**

- (a) Radiobiological principles
- (b) Carcinogenesis, mutations
- (c) Teratogenesis, radio-protection
- (d) Acute whole body radiation syndromes
- (e) Acute radiation reactions
- (f) Late radiation reactions
- (g) Tissue tolerance and scoring
- (h) Chemoradiation
- (i) Application of alpha/beta, managing gaps

### **Suggested Learning and Teaching Approaches**

The learning outcomes of this paper could be achieved by the following:

- practical laboratory tutorials for computer planning
- student centred tutorials with an emphasis on class discussion and debate
- the use of media such as videos, journals, and texts, will provide a rich source of material for discussion, and exploration;

### **Assessment of Learning Outcomes**

Summative assessment will consist of the following:

- |                                      |   |     |
|--------------------------------------|---|-----|
| • one assessment (dosimetry)         | = | 30% |
| • one radiobiology test              | = | 20% |
| • one dosimetry viva (67% pass mark) | = | 50% |

One reassessment can occur if the pass mark of 67% is not achieved in the dosimetry viva.

A pass will be awarded to all students who gain 50% overall.

### **Reporting Results to Students**

Results will be reported to students as follows:

Coursework out of 100

Student result notices will carry grades from A to E

### **Resources**

Eclipse Planning System



## Textbooks

- Bomford, C., Kunkler, I., & Sherriff, S. (2003). *Walter & Miller's Textbook of Radiotherapy*. (6<sup>th</sup> Edition). Churchill Livingstone.
- Ball, J., & Moore, A. (1997) *Essential Physics for Radiographers*. Blackwell Scientific.
- Bomford, C.K. & Kunkler, I.H. (2003) *Walter and Miller's textbook of radiotherapy : radiation, physics, therapy and oncology*. (6th ed.) Edinburgh, Churchill Livingstone.
- Bushberg, J. T. (2002) *The essential physics of medical imaging*. Philadelphia, Pa.; London : Lippincott Williams & Wilkins.
- Chesney, D., & Chesney, M. (1984). *Chesney's equipment for student radiographers*. Blackwell Scientific.
- Dowd, S. (1994). *Practical Radiation Protection and Applied Radiobiology*. W B Saunders Company
- Giancoli, D.C. (2005). *Physics - Principles with Applications*. (6<sup>th</sup> Edition). Prentice Hall, USA.
- Coia, L., & Moycan, D. (1989). *Introduction to Clinical Radiation Oncology*. Medical Physics Publishing Co-Op, Madison.
- Greene, D & Williams, P. (1997) *Linear accelerators for radiation therapy* Institute of Physics Publishing
- Griffiths, S., & Short, C. (1994). *Radiotherapy : Principles to Practice*. Churchill Livingstone.
- Hendee, W. & Ritenour R. (2002). *Medical imaging physics*. New York ; Chichester : Wiley-Liss,
- International Commission on Radiation Units and Measurements: (1993) Prescribing, Recording, and Reporting Photon Beam Therapy. (*ICRU Report 50*)
- International Commission on Radiation Units and Measurements: (1999) Prescribing, Recording, and Reporting Photon Beam Therapy. Supplement to ICRU 50 (*ICRU Report 62*).
- Karzmark, C. J (1998) *A primer on theory and operation of linear accelerators in radiation therapy*. Madison, Wis. Medical Physics Pub.
- Khan, F. (2003). *The Physics of Radiation Therapy*. (3<sup>rd</sup> Edition). Williams and Wilkins, Baltimore.
- Morris, S. (2001). *Radiotherapy physics and equipment*. Churchill Livingstone.
- Purdy, J A. (2001) *3-D conformal and intensity modulated radiation therapy : physics & clinical applications*. Madison, WI, U.S.A. Advanced Medical Pub.
- Podgorsak, E.B., ed. (2005) *Radiation Oncology Physics: A Handbook for Teachers and Students* International Atomic Energy Agency, Vienna
- Roberts, D., & Smith, N. (1988). *Radiographic Imaging*. Churchill Livingstone.
- Stanton, R., & Stinton, D. (1992). *An Introduction to Radiation Oncology Physics*. Medical Physics Publishing.
- Washington, C.M., & Leaver, D.T. (2010). *Principles and Practice of Radiation Therapy*. (3<sup>rd</sup> Edition). Mosby, St Louis, Missouri.



## **APPENDIX A**

## EXTERNAL MODERATORS

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### 1. Functions

- External moderators shall be responsible for providing an impartial evaluation of student assessment for degree programme papers.
- One external moderator will be appointed from the profession to moderate radiation therapy focused written examinations.
- External specialist lecturers moderate other papers, eg. Cancer Cell Biology.

#### More Specifically

The functions of the external moderators are to ensure that:

- the evaluation of students' performance was fair and impartial;
- the standard of achievement required of students is comparable with that required in other institutions offering degree qualifications.

### 2. Specific Responsibilities

- To report to the Radiation Therapy Board of Studies and Examinations Committee on the effectiveness of assessments and any conclusions drawn from them.
- To have authority to report directly to the Head of Department where there are concerns about standards of assessment and performance.
- To participate as required in any meeting of the Board of Studies and Examinations which relates to results recommended during the moderator's period of office.
- To concur with the form and content of summative assessments for the paper.
- To ensure that the assessments are conducted in accordance with programme regulations.

### 3. Appointment Criteria

To carry out their responsibilities, external moderators must be:

- competent in assessing student knowledge and skills at degree level;
- expert in the field of study concerned;
- impartial in judgement;
- properly briefed on their role and on the guiding principle and philosophy of the course.

4.

**Appointment Procedure**

- The appointment of all external moderators must be approved by the Board of Studies and Examinations based on the recommendations of the Head of Department.
- External moderators will normally be appointed for a term of three years.
- New moderators should take up their appointment on or before the retirement of their predecessors. Moderators should remain available after the last assessments with which they are to be associated in order to deal with any subsequent reviews of decisions.

## **INTERNAL MODERATORS**

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**1. Functions**

Internal moderators shall be responsible for peer review of student assessment for all degree programme papers.

**2. Specific Responsibilities**

- To concur with the form and content of summative assessments for the paper.
- To ensure that the assessments are conducted in accordance with programme regulations.

**3. Appointment Procedure**

The appointment of all internal moderators must be approved by the Head of Department.

## **APPENDIX B**

## DEGREE MONITOR

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This person will have responsibility for the following:

- appraising the quality management systems for the programme on an ongoing basis;
- assisting the University of Otago in identifying ways to maintain and enhance the quality of the programme;
- notifying the Head of Department and the Board of Studies and Examinations of any concerns regarding the standards or integrity of the programme.

This is to be achieved by:

- Providing verbal feedback to the Head of Department.
- Providing a report on the quality of the qualification, plus the teaching and research that support the qualification, to the Head of Department.

### Person Specification

A monitor should:

- Be external to the University.
- Act as a critical colleague and make constructive comment.
- Possess appropriate research and academic expertise and experience to support a sound judgement on the quality of the qualification and the systems which support it.

In appointing a monitor the following should be taken into account:

- Qualifications appropriate to the profession.
- Present and/or past position of employment, preferably a current or recent academic position.
- Breadth of experience across teaching, research and/or employment.

### Appointment Process

The appointment is approved by the Radiation Therapy Board of Studies and Examinations.

### Term of Monitoring

Monitors will normally be appointed for a period of three years and will not normally serve for more than six years in total.



## **Procedures**

A copy of the Annual Self Evaluation Report will be sent to the monitor which will include:

- A copy of the External Moderator's Reports
- A copy of the Research Report
- A five-year projected research plan and objectives for the department
- A copy of staff professional development reports

## **Monitor's Report**

### ***Content:***

The report will address the following issues:

- An outline of the monitoring process
  - areas visited
  - meetings held
  - summary of topics discussed
  - any recommendations for future action
- Progress in responding to matters specified in the self-evaluation report.
- Progress in responding to recommendations at the previous monitor's visit.
- Moderation processes and performance.
- Proposed changes to the programme.
- Areas of strength and good practice.
- Areas of concern.
- Appropriateness of infrastructure to support research.
- Physical and financial resources in the context of achieving teaching and research objectives.
- Overall quality of research in the context of international research in similar areas.

### ***Report:***

- The report will be drafted and submitted to the Head of Department for comment.
- Any discrepancies must be discussed between the Head of Department and the monitor.
- The final signed report will be submitted to the Radiation Therapy Board of Studies and Examinations through the Head of Department.

### ***Response:***

- A draft response will be prepared by the Head of Department.
- The report and draft response will be discussed at the Radiation Therapy Board of Studies and Examinations where the final response from the University will be approved.
- The Head of Department will submit the response to the report to the monitor.

## **APPENDIX C**



**Minutes of the special meeting of the Academic Board  
held on Wednesday 25 October 1995**

**Present:** Trevor Boyle (Chair), Mike Marfell-Jones, Richard Winder, Packiam Skinnon, Tommy Honey, Jill Harris, Tim Lockyer, Murdoch Pahi, Mike Cooper, Stuart Arden.

**Apologies:** Christine Roberts, Andrew Logan, Sheena Hudson

**1. Validation Committee recommendations**

The following programmes were presented by the Validation Committee for endorsement by the Academic Board:

Bachelor of Design  
Bachelor of Health Sciences (Radiation Therapy)  
Bachelor of Health Sciences (Radiation Therapy) conversion  
Bachelor of Applied Technology  
Bachelor of Counselling Studies  
Bachelor of Hospitality Management  
Bachelor of Tourism Management  
Master of Science (by research) and Doctor of Philosophy

Richard Winder noted that of these, only Bachelor of Health Sciences (Radiation Therapy) had satisfied the Validation Committee's conditions.

**95/139 Resolved**

That the Academic Board approves the programme and recommends to Council the approval of the **Bachelor of Health Sciences (Radiation Therapy)** as a three year full time programme for 1997 to 2001 inclusive. Enrolment will be onto the full programme or part time on individual modules. Stage 1 of the programme is 33 teaching weeks plus 7 weeks of vacation, a total of 40 weeks. Stages 2 and 3 are 36 teaching weeks plus 3 weeks of vacation, a total of 39 weeks.

**Bachelor of Tourism Management**

Richard Winder advised that this degree had been removed from consideration.

The remaining programmes were to be considered at a special Academic Board meeting to be held on :

**Monday, 30 October 1995, 3.00pm, in the New Council Room.**

2. **Formal Thankyou**

The Academic Board thanked with acclamation the Academic Registrar and his various Validation Committee teams for their tremendous efforts in the degree development process.

The meeting closed at 9.00am.

Signed:

\_\_\_\_\_  
Chairperson

Dated:

octsp.min

Page 2.

Octsp.min

403.4

**FACULTY OF SCIENCE & HEALTH SCIENCES**

MEMORANDUM

Ref: MRT

TO: HOD, Radiation Therapy

FROM: Dean

SUBJECT: NZQA Official degree approval notification

DATE: 14 August 1996

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Herewith a copy of the revised letter from NZQA re degree approval (and a copy of MHC's confirmation of receipt) for your records.



Dr Mike Marfell-Jones  
Dean



CENTRAL  
INSTITUTE OF  
TECHNOLOGY

*Te Whare Wananga O Whirinaki*

9 August, 1996

A2-54-1

*Copied MMS*

Barry Dawe,  
NZ Qualifications Authority,  
P.O. Box 160,  
WELLINGTON

Dear Barry,

Thank you for your letter of 1 August, 1996 advising of the resolution by the Board of the Qualifications Authority in respect of the Bachelor of Health Science (Radiation Therapy) degree.

The purpose of my letter is to confirm my understanding and acceptance of the four part resolution contained in your letter referring to the BHSc and the associated Conversion programme.

Thank you for your advice of the outcome.

Yours sincerely,

MICHAEL H. COOPER  
Principal and CEO

Central Institute of Technology, Somme Road, Heretaunga  
P O Box 40-740, Upper Hutt, New Zealand, Telephone (04) 527 6398, Facsimile (04) 527 6359  
Auto Attendant (04) 527 6397

NEW ZEALAND QUALIFICATIONS AUTHORITY  
Mana Tohu Matauranga o Aotearoa



1 August 1996

Mr Michael H Cooper  
Chief Executive  
Central Institute of Technology  
Box 40-740  
UPPER HUTT

ACTIVITY	
FILE NO	Acq 54-1
P	
P	
PR	
PR	
AP	
PR	
DE	Source

Dear Mr Cooper

The Board of the Qualifications Authority accepted the recommendation of the panel which evaluated Central Institute of Technology's Bachelor of Health Science (Radiation Therapy) degree. For your information I have incorporated into this letter the full text of the resolution approved by the Board:

It was resolved by the Board:

- "i that the proposed bachelor of Health Science (Radiation Therapy) be approved;
- ii that the Central Institute of Technology be accredited to provide the Bachelor of Health Science (Radiation Therapy);
- iii that the conversion programme presented for approval by the Central Institute of Technology is approved as "a conversion programme leading to the award of Bachelor of Health Science" and that the Central Institute of Technology is accredited to teach it;
- iv the conversion programme is approved for the same period of time as the full programme and that the Central Institute of Technology is accredited to teach it for that period of time."

The Board requests that a formal reply be received from you indicating your understanding and acceptance of the resolution.

The length of the course is three years, full-time.

Degree and Post-graduate qualification approval and accreditation allows you to publicise the status of the programme by the following words on certificates and publications:

*"This degree is approved by the New Zealand Qualifications Authority under the provisions of the Education Act 1989, and Central Institute of Technology is accredited to offer it."*

The approval and accreditation is dependent upon your organisation maintaining the same standards as were documented and demonstrated in your application, and during the approval and accreditation process. If there are any significant changes you must advise NZQA immediately.

Subsequent to approval being granted, Qualifications Authority monitoring will be applied. You will be required to pay all costs relating to the monitoring process.

The approval and accreditation will be reviewed periodically. The first review date has been set at November 2001. Three months before this date information will be sent to you on the report which will be required. Two months before the review date you should send the Authority a report on the course and its delivery. You will be required to pay all the costs relating to this review.

Please convey my congratulations to members of Central Institute of Technology who contributed to the success of this degree approval process.

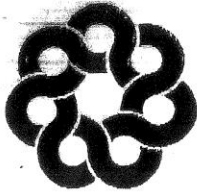
Yours sincerely



Barry Dawe  
Team Leader  
Quality Assurance



## **APPENDIX D**



## New Zealand Vice-Chancellors' Committee

*Postal address*  
P O Box 11-915, Wellington, New Zealand  
*Street address*  
11th floor, 94 Dixon Street, Wellington

Telephone 64-4-381 8500  
Facsimile 64-4-381 8501  
Website [www.nzvcc.ac.nz](http://www.nzvcc.ac.nz)

### COMMITTEE ON UNIVERSITY ACADEMIC PROGRAMMES

Minutes of a meeting held on Thursday/Friday,  
19/20 July 2001, from 9.30 am, Thursday, in the NZVCC offices

<b>PRESENT:</b>	Professor G S Fraser	NZVCC (Chair)
	Professor D M Ryan	The University of Auckland
	Dr D W Brook	Auckland University of Technology
	Associate Professor K Turner	The University of Waikato
	Professor K S Milne	Massey University
	Ms P Fenwick	Victoria University of Wellington
	Dr J E Cameron	University of Canterbury
	Professor R J Field	Lincoln University
	Dr P H Meade	University of Otago
	Mr J W Scott	APNZ
	Mr D Scott	ACENZ
	Mr S Huggard	NZUSA
<b>In attendance:</b>	Mr L S Tairaoa	NZVCC (part of the time)
	Mrs A M Werren	NZVCC
	Dr A West	NZQA ) for
	Ms K Colbert	NZQA ) Item 11

12	Bachelor of Commerce and Administration / Bachelor of Arts	VUW/00	BCA/9 BA/45	na	na	Approved
<b>UNIVERSITY OF CANTERBURY</b>						
	Qualification	Univ. code	Proposal identification	Length*	PG Funding*	Resolved
1	Bachelor of Arts	UC/01	BA/1	na	na	Approved
2	Bachelor of Education	UC/01	BEEd/1	na	na	Approved
3	Bachelor of Education	UC/01	BEEd/2	na	na	Approved
<b>LINCOLN UNIVERSITY</b>						
	Qualification	Univ. code	Proposal identification	Length*	PG Funding*	Resolved
1	Graduate Diploma in Leisure Events Management	LU/01	GDipLEM/1	1	na	Approved
2	Bachelor of Tourism Management	LU/01	BTourMgt/1	3	na	Approved
3	Diploma in Conservation and Ecotourism Management	LU/01	DipCEM/1	2	na	Approved
4	Graduate Certificate in Maori Planning	LU/01	GCertMP/1	0.5	na	Approved
5	Graduate Diploma in Maori Planning	LU/01	GDipMP/1	1	na	Approved
6	Certificate in Maori Studies	LU/01	CertMS/1	1	na	Approved
7	Postgraduate Certificate in Indigenous Planning	LU/01	PGCertIP/1	0.5	na	Approved
8	Postgraduate Diploma in Indigenous Planning	LU/01	PGDipIP/1	1	na	Approved
9	Master of Maori and Indigenous Planning and Development	LU/01	MIPD/1	2	PG	Approved
<b>UNIVERSITY OF OTAGO</b>						
	Qualification	Univ. code	Proposal identification	Length*	PG Funding*	Resolved
1	Foundation Studies Certificate	UO-01	FoundStudCert-1	na	na	Approved
2	Bachelor of Health Sciences	UO-01	BHealSc-1	3	na	Approved
3	Bachelor of Health Sciences	UO-01	BHealSc-3 (Revised)	3	na	Approved backdated to 01.07.0
4	Bachelor of Medical Sciences	UO-01	BMedSc-1	(Hons) 1	PG	Approved
5	Postgraduate Diploma in Clinical Dentistry	UO-01	PGDipClinDent-1	1	PG	Approved
6	Master of Dental Surgery	UO-01	MDS-1	2	PG	Approved
7	Postgraduate Diploma in Health Sciences	UO-01	PGDipHealSc-1	1	PG	Approved
8	Postgraduate Certificate in Health Sciences	UO-01	PGCertHealSc-1	0.5	PG	Approved
9	Postgraduate Certificate in Health Sciences	UO-01	PGCertHealSc-2	0.5	PG	Approved
10	Postgraduate Certificate in Aeromedical Evacuation	UO-01	PGCertAerEv	0.5	PG	Approved
11	Master of Primary Health Care	UO-01	MPHC-1	2	PG	Approved
12	Postgraduate Certificate in Primary Health Care	UO-01	PGCertPHC-1	0.5	PG	Approved