UNIVERSITY of OTAGO
Te Whare Wānanga o Otāgo
NEW ZEALAND
WELLINGTON

Bachelor of Radiation Therapy

BRT

Curriculum Document

January 2021

Contents

1. Graduate Profile

1.1 Description

The Bachelor of Radiation Therapy graduates are competent and flexible radiation therapists who possess effective and empathetic communication skills, combined with an inquiring nature conducive to lifelong learning in a technology driven environment. Graduates will have a sound theoretical understanding of radiation therapy and demonstrate safe and professional practice.

1.2 Graduate Attributes

- **GLOBAL PERSPECTIVE**: Appreciation of international perspectives in the radiation therapy and wider healthcare professions and the nature of global citizenship
- **INTERDISCIPLINARY PERSPECTIVE**: Commitment to intellectual openness and curiosity, and the awareness of the limits of current knowledge and the links amongst health disciplines
- **LIFELONG LEARNING**: Commitment to the on-going acquisition of new knowledge and new skills, and an ability to apply these to a constantly changing, technology driven environment, to reflect and review own practice and be responsive to the need for professional development
- **SCHOLARSHIP**: Commitment to the fundamental importance of the acquisition and development of knowledge and understanding
- **COMMUNICATION**: Ability to communicate information, arguments and analyses effectively, both orally and in writing
- **INTERPERSONAL SKILLS**: Ability to communicate appropriately with staff, patients and families, recognising the need for empathy and sensitivity
- **CRITICAL THINKING:** Ability to analyse radiation therapy and healthcare issues logically, to challenge conventional assumptions, to consider different options and viewpoints, make informed decisions and act with flexibility, adaptability and creativity
- **CULTURAL UNDERSTANDING**: Knowledge and appreciation of biculturalism within the framework of the Treaty of Waitangi; knowledge and appreciation of multiculturalism; and an ability to apply such knowledge in a culturally appropriate manner
- **ETHICS:** Knowledge of ethics and the application of ethical standards within the workplace and community
- **ENVIRONMENTAL LITERACY**: Basic understanding of the principles that govern radiation therapy and healthcare systems, the effects of human activity on these systems, and the cultures and economies that interact with those systems
- **INFORMATION LITERACY**: Ability to apply specific skills in acquiring, organising, analysing, evaluating and presenting information, in particular recognising the increasing prominence of digital-based activity to remain up to date with ever changing radiation therapy practice
- **RESEARCH**: Understanding of the principles of qualitative and quantitative methods, to report on this in an appropriate form by recognising when information is needed, and locating, retrieving, evaluating and using it effectively
- **SELF-MOTIVATION**: Capacity for self-directed activity and the ability to work independently
- **TEAMWORK**: Ability to work effectively as both a team leader and a team member within radiation therapy teams and the wider healthcare team

2. Programme Description

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.

The Bachelor of Radiation Therapy comprises three Year groups. Generally each Year will be completed in one year's full time study. **All papers are compulsory.**

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

2.1 Year I

- 31 weeks attending classes at the Department of Radiation Therapy, University of Otago, Wellington;
- 2 weeks Radiation Therapy Practice with a clinical provider.
- Year I consists of the following papers:

Paper Code	Paper Title	Points
RADT121	Radiation Therapy Practice I	11
RADT122	Anatomy & Imaging	32
RADT123	Radiation Therapy and Oncology I	30
RADT124	Radiation Therapy Planning Concepts I	12
RADT125	Healthcare Communication	8
RADT126	Health & Human Behaviour	9
RADT127	Radiation Technology I	18

1 point is equivalent to 12.5 hours of student learning

2.2 Year II

- 1 semester Radiation Therapy Practice with a clinical provider;
- 1 semester attending classes at the Department of Radiation Therapy, University of Otago, Wellington.
- Year II consists of the following papers:

Paper Code	Paper Title	Prerequisite	Points
RADT211	Radiation Therapy Practice II	All Year I papers	60
RADT212	Principles of Research	All Year I papers	6
RADT213	Advanced Healthcare Communication	RADT126 & RADT125	10
RADT214	Radiation Technology II	RADT127	16
RADT215	Radiation Therapy and Oncology II	RADT123	10
RADT216	Radiation Therapy Planning Concepts II	RADT123 & 124	18

1 point is equivalent to 12.5 hours of student learning

2.3 Year III

- 1 semester attending classes at the Department of Radiation Therapy, University of Otago, Wellington;
- 1 semester Radiation Therapy Practice with a clinical provider.
- Year III consists of the following papers:

Paper Code	Paper Title	Prerequisite	Points
RADT311	Radiation Therapy Practice III	RADT312, 313, 314, 315	60
RADT312	Literature Analysis	RADT212	12
RADT313	Professional Development	RADT213	12
RADT314	Radiation Therapy and Oncology III	RADT215	14
RADT315	Radiation Therapy Planning Concepts III	RADT215 & RADT216	22

1 point is equivalent to 12.5 hours of student learning

2.4 Completion of the Course

- Students will need a clinical placement before re-enrolling in a clinical paper.
- Students will be expected to complete the programme in five years or less.

2.5 Occupational Conditions

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 i.e. Radiation Therapy Practice I, Radiation Therapy Practice II and Radiation Therapy Practice III, and fully prepare 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 1600 clinical hours (Radiation Therapy Practice papers, plus Year II and Year III work experience) at the completion of the degree.

3. Assessment

3.1 Assessment for the BRT follows the Guidelines for the Assessment of Student Performance

https://www.otago.ac.nz/administration/policies/otago078920.html

Each paper within the programme has its own assessment pattern outlined in the Paper Descriptors section of this Curriculum Document.

3.2 Assessment Standards

The overall standards are laid out in the Graduate Profile as the attributes of the graduate of the programme (see section 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.

3.3 Accreditation

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

4. Management of the Programme

4.1 Programme Co-ordination

The Director of the Bachelor of Radiation Therapy and the Head of Department have responsibility for the overall co-ordination of the programme.

4.2 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.

4.3 Year Convenors

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

5. Relationship to Other Programmes

5.1 Overseas Undergraduate Qualifications

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 and many Arab states.

5.2 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.

6. Programme Regulations

6.1 The regulations for the Bachelor of Radiation Therapy are contained in the University of Otago Calendar www.otago.ac.nz/courses/qualifications/brt.html#regulations

7. Minimum Coursework Requirements

7.1 **Attendance**

a) Students are expected to attend all classes unless excused on medical or other acceptable grounds.
b) A medical certificate will be required from any student who is absent from class for more than two days, due to illness.

7.2 **Professional Attitudes**

Throughout the year students are formatively assessed on Professional Attitudes. This information may be available to Clinical Providers and is an important part of the programme.

7.3 **Request for Leave**

a) Whilst at the University of Otago, Wellington all requests for leave from the programme are considered by the Director of the Undergraduate Programme.
b) Whilst on clinical placement, all requests for leave from the programme that are 2 days or less are considered by the Clinical Tutor. All requests for leave that are more than 2 days are considered in consultation with the university.

7.4 **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 Convenor (evidence may need to be provided).
d) If coursework assessments are late:
    i. form to be completed (based on exam special consideration form)
    ii. provide evidence if possible to support late submission

this is considered by the Paper Convenor in consultation with the Year Convenor.

Outcomes

- reason for late submission is accepted
- reason for late submission is not accepted and a penalty to the assessment mark may be applied.

Director of the Programme to be informed of situations as appropriate

e) In the case of illness at the time of a test, the student must email the Department PRIOR to the start of a test. A medical certificate must be presented (dated the day of the test) to the Director of the Programme 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.
f) 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.

7.5 **Examinations**

a) Terms is defined as achieving at least a 50% pass in the coursework component, and to 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 are no aegrotat passes, although students may be eligible to apply for special consideration for a deferred examination.
d) Students must pass all papers in the programme to be awarded the Bachelor of Radiation Therapy degree by the University of Otago.

7.6 Support

The Radiation Therapy Department encourages students to seek support if they find they are having difficulty with their studies.

Contact:
Year Convenor or the Associate Dean of Student Affairs.
Or
Disability Information and Support
for issues with disability, temporary or permanent impairments, injury or chronic illness

Phone:	(03) 479 8235
Fax:	(03) 479 5873
Email:	disabilities@otago.ac.nz
Website:	https://www.otago.ac.nz/disabilities/index.html

8. Academic Integrity

8.1 Academic integrity

Academic integrity means being honest in studying and assessments. It is the basis for ethical decision-making and behaviour in an academic context. Academic integrity is informed by the values of honesty, trust, responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the University's Academic Integrity Policy.

8.2 Academic Misconduct

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously by the University. Types of misconduct include plagiarism, copying, unauthorised collaboration, taking unauthorised material into a test or exam, impersonation, and assisting someone else's misconduct. A more extensive list of the types of academic misconduct and associated processes and penalties is available in the University's Student Academic Misconduct Procedures.

It is the student's responsibility to be aware of and use acceptable academic practices when completing assessments.

Academic Integrity – A Brief Guide for Students
Academic Integrity Policy
Student Academic Misconduct Procedures
Academic Integrity and Academic Misconduct Information for Students

PAPER DESCRIPTORS: YEAR ONE

RADT121 Radiation Therapy Practice I

RADT122 Anatomy & Imaging

RADT123 Radiation Therapy and Oncology I

RADT124 Radiation Therapy Planning Concepts I

RADT125 Healthcare Communication

RADT126 Health & Human Behaviour

RADT127 Radiation Technology I

RADT121 Radiation Therapy Practice I

Paper Code	RADT121
Date	February 2021
Points	11
Aim	To enable students to gain a basic understanding of radiation therapy practice and integrate academic learning in the first year of the programme.
Recommended Entry Level	Entry to the programme

Learning outcomes

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

1. demonstrate knowledge of medical and radiation therapy terminology;
2. demonstrate knowledge of planar anatomy;
3. describe and discuss legal and ethical issues related to radiation therapy and patient care;
4. describe and discuss linear accelerator use;
5. demonstrate routine radiation therapy techniques;
6. describe core qualities and skills involved in establishing a healthcare professional-patient relationship in the radiation therapy setting;

Content:

Corresponding to learning outcome 1

a) Medical terminology
b) Radiation therapy terminology

Corresponding to learning outcome 2

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 3

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

Corresponding to learning outcome 4

a) Linear accelerators
b) Pendant use

Corresponding to learning outcome 5

a) Immobilisation and positioning devices
b) Electron cut outs
c) Multi leaf collimators
d) Bolus
e) Routine radiation therapy techniques/set ups
f) Infection control and manual handling

Corresponding to learning outcome 6

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

Suggested Learning and Teaching Approaches

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

- clinical practice in Department;
- 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

- assignment = 50% of total mark
- practical assessment = 50% of total mark

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

RADT122 Anatomy and Imaging

Paper Code	RADT122
Date	February 2021
Points	32
Aim	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
Recommended Entry Level	Entry to the programme

Learning outcomes

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

1. describe the anatomical organisation of the human body in terms of cells, tissues and organs for each of the principal organ systems;
2. describe in detail the lymphatic drainage of structures affected by cancer;
3. use knowledge of gross body anatomy to identify body structures on X-rays, CT scans and MRI scans;
4. describe DNA synthesis and gene expression;
5. describe the cell cycle and cell cycle progression;
6. describe mutagenesis and carcinogenesis.

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

b) Lymphatic drainage of structures in: head and neck, thorax, abdomen, pelvis and extremities

Corresponding to learning outcome 3

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

Corresponding to learning outcome 4

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

Corresponding to learning outcome 5

a) Cell cycle, check points and progression

Corresponding to learning outcome 6

a) Mutagenesis, proto-oncogenes and tumour suppressor genes
b) Carcinogenesis as a multi-step process
c) Hallmarks of cancer

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:

- test 1 = 20% of total mark
- test 2 = 20% of total mark
- test 3 (imaging) = 20% of total mark
- 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.

RADT123 Radiation Therapy and Oncology I

Paper Code	RADT123
Date	February 2021
Points	30

Aim	To enable students to gain a basic understanding of oncology, and the treatment modalities available to treat malignant disease.
Recommended Entry Level	Entry to programme

Learning outcomes

On completion of this paper the successful student will be able to describe and discuss in some detail:

1. pathology of common tumours and the ways in which they are classified;
2. treatment modalities used to treat benign and malignant disease;
3. radiation therapy techniques used in the treatment of disease;
4. implications for patients when receiving radiation therapy;
5. chemotherapy and immunotherapy for patients with malignant disease
6. pharmacological approach to patient care during radiation therapy;
7. clinical trials.

Content:

Corresponding to Learning Outcome 1

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

Corresponding to Learning Outcome 2

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 3

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

Corresponding to Learning Outcome 4

a) Local reactions to radiation therapy
b) Systemic reactions to radiation therapy
c) Blood counts
d) Diet and fluid intake
e) Patient information
f) Specific patient needs, including catheter/colostomy

Corresponding to Learning Outcome 5

a) Principles of chemotherapy for cancer
b) Cytotoxic chemotherapy
c) Targeted chemotherapy
d) Hormone therapy
e) Immunotherapy
f) Side effects of chemotherapy, hormone therapy and immunotherapy

Corresponding to Learning Outcome 6

a) Pharmacological principles
b) Adverse reactions to drugs
c) Medications used for radiation therapy reactions

d) Management of all treatment related side effects including combined modality treatments

Corresponding to Learning Outcome 7

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;
- one two-week visit to a radiation therapy department

Assessment of Learning Outcomes

Summative assessment will consist of the following:

- test 1 = 20% of total mark
- assignment (wiki) = 20% of total mark
- test 2 = 20% of total mark
- 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.

RADT124 Radiation Therapy Planning Concepts I

Paper Code	RADT124
Date	July 2021
Points	12
Aim	To enable students to gain a basic understanding of planning the treatment of malignant disease
Recommended Entry Level	Entry to programme

Learning outcomes

On completion of this paper the successful student will be able to demonstrate:

1. knowledge of basic calculations used in radiation therapy;
2. an understanding of manual planning principles;
3. knowledge and performance of basic principles and concepts of computer planning.
4. describe the radiobiology of normal tissues and tumours.

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

Corresponding to learning Outcome 4

a) General radiobiology (ionisation, free radicals, DNA damage and cell death)
b) Radiobiology of normal tissues (pathology and kinetics)
c) Radiobiology of tumours (5Rs, cell survival curves, linear quadratic model)
d) Hyper- and hypofractionation (application to tissue alpha/beta ratio)

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:

- assignment = 30% of total mark
- test (calculations) = 30% of total mark
- viva = 40% of total mark

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

RADT125 Healthcare Communication

Paper Code	RADT125
Date	July 2021
Points	8
Aim	To introduce students to the foundations of healthcare communication skills and strategies and apply these 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 core verbal and non-verbal communication skills in a range of contexts;
2. analyse different social, professional and personal value bases in the provision of healthcare;
3. identify the principles of culturally safe healthcare practice in the radiation therapy setting.

Content:

Corresponding to Learning Outcome 1

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) Cultural context of 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 2

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

Corresponding to Learning Outcome 3

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:

- assignment = 50% of total mark
- group presentation = 50% of total mark

Formative assessment will consist of participation in a communication skills workshop and submission of a written self-reflection assignment in order to meet coursework terms.
A pass will be awarded to all students who gain 50% overall in the coursework and participate in the communication skills workshop.

RADT126 Health and Human Behaviour

Paper Code	RADT126
Date	February 2021
Points	9

Aim	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 Māori 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:

- E poster = 35% of total mark
- group presentation = 25% of total mark
- 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.

RADT127 Radiation Technology I

Paper Code	RADT127
Date	February 2021
Points	18
Aim	To introduce students to the basic principles of radiation physics, the application to radiation technology and the use of radiation therapy equipment.
Recommended Entry Level	Entry to the programme

Learning outcomes

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

1. demonstrate an understanding of general physical principles in relation to radiation therapy;
2. discuss the basic physics of X and gamma radiation;
3. describe the principles of construction and operation of radiation therapy and imaging equipment;
4. describe the principles of diagnostic imaging technologies;
5. describe the principles of radiation protection and safety.

Content:

Corresponding to Learning Outcome 1

a) Measurement units, uncertainties
b) Systematic and random errors
c) Properties of electromagnetic radiation
d) Electric charge, fields, potential
e) DC circuits and electrical measurements

f) Alternating current and rectification

Corresponding to Learning Outcome 2

a) Ionising radiation, exposure, absorbed 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) Kilovoltage X-ray units and X-ray tubes
b) Megavoltage X-ray units and linear accelerator technology
c) Absorbed dose distributions in a medium including PDDs, profiles, isodose curves

Corresponding to Learning Outcome 4

a) Radiographic and CT imaging
b) MRI
c) Nuclear medicine imaging including SPECT, PET

Corresponding to Learning Outcome 5

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

Suggested Learning and Teaching Approaches

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

- Lectures;
- student centred tutorials with an emphasis on group and class discussion;
- laboratory demonstrations and practical sessions.

Assessment of Learning Outcomes

Summative assessment will consist of the following:

- test 1 = 20% of total mark
- test 2 = 20% of total mark
- test 3 = 20% of total mark
- 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.

PAPER DESCRIPTORS: YEAR TWO

RADT211 Radiation Therapy Practice II

RADT212 Principles of Research

RADT213 Advanced Healthcare Communication

RADT214 Radiation Technology II

RADT215 Radiation Therapy and Oncology II

RADT216 Radiation Therapy Planning Concepts II

RADT211 Radiation Therapy Practice II

Paper Code	RADT211
Date	January 2021
Points	60
Aim	Consolidation of academic learning in Year I: the student will gain knowledge and acquire skill to undertake the routine tasks of a radiation therapist, under supervision
Recommended Entry Level	Successful completion of all Year I papers

Learning outcomes

On completion of this paper the successful student will be able to, across three domains: CT, planning and treatment;

1. apply knowledge and demonstrate safe practice in the workplace;
2. recognise patient needs and/or significant changes in patients' condition;
3. demonstrate appropriate verbal and nonverbal communication skills;
4. demonstrate the ability to work in a healthcare team;
5. demonstrate appropriate self-management techniques;
6. demonstrate safe practices in the workplace;
7. demonstrate the ability to identify problems in the clinical setting;
8. develop an increasing awareness of quality assurance;
9. demonstrate reflective practice.

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.

Assessment of Learning Outcomes

Summative assessment will consist of all outcomes within each domain:

- CT assessment = Pass/Fail
- Planning assessment = Pass/Fail
- Treatment assessment = Pass/Fail

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

Reassessment:

- reassessment can occur in all domains for each enrolment of the paper

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

RADT212 Principles of Research

Paper Code	RADT212
Date	July 2021
Points	6
Aim	Student will have a basic understanding of different research methodologies that underpin quantitative and qualitative research.
Recommended Entry Level	Successful completion of all Year I papers

Learning outcomes:

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

1. describe the difference between quantitative or qualitative research;
2. demonstrate a basic understanding of different study designs;

3. demonstrate a basic understanding of the process involved in obtaining ethical approval for research involving human subjects;
4. produce a critical analysis of two research papers on a chosen topic.

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) Māori Consultation
d) Locality assessment approval

Corresponding to Learning Outcome 4

a) Description and analysis of two 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:

- quantitative assignment = 50% of total mark
- qualitative assignment = 50% of total mark

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

RADT213 Advanced Healthcare Communication

Paper Code	RADT213
Date	July 2021
Points	10
Aim	To enable the student to develop effective interpersonal skills when working with patients in pain (curative and palliative) and/or terminally ill
Recommended Entry Level	Successful completion of RADT126: Health and Human Behaviour and RADT125: Healthcare Communication

Learning outcomes

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:

- Case Study = 50% of total mark
- Learning Journal = 50% of total mark

Formative assessment will consist of participation in a communication skills workshop and submission of a written self-reflection assignment in order to meet coursework terms.
A pass will be awarded to all students who gain 50% overall in the summative assessment and participate in the communication skills workshop.

RADT214 Radiation Technology II

Paper Code	RADT214
Date	July 2021
Duration	80 contact hours and 120 hours of independent learning
Points	16
Aim	To enable students to apply their understanding of radiation therapy equipment, radiation therapy physics and imaging to the planning and delivery of radiation therapy
Recommended Entry Level	Successful completion of RADT127: Radiation Technology I

Learning outcomes
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) Rationale for quality assurance
b) Principles of quality assurance
c) Systems of quality assurance

Corresponding to Learning Outcome 5

a) Imaging Techniques: CT, MRI, PET, OBI
b) IGRT and clinical applications
c) IMRT, VMAT and tomotherapy
d) Stereotactic techniques

Corresponding to Learning Outcome 6

a) Sealed and unsealed sources
b) Brachytherapy loading techniques and delivery systems
c) Unsealed therapy procedures
d) Brachytherapy 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;
- demonstrations and practical sessions.

Assessment of Learning Outcomes

Summative assessment will consist of the following:

- assignment = 30% of total mark
- test = 30% of total mark
- 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.

RADT215 Radiation Therapy and Oncology II

Paper Code	RADT215
Date	July 2021
Points	10
Aim	To enable the student to integrate their knowledge of oncology and treatment modalities to determine optimal treatment for malignant disease
Recommended Entry Level	Successful completion of RADT123: Radiation Therapy and Oncology I

Learning outcomes

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

1. discuss the oncology of and the clinical rationale for selecting appropriate treatment for the stated 'Site List'(tumours that are commonly treated clinically);
2. discuss the implications of the Cartwright Inquiry.

Content:

Corresponding to Learning Outcome 1

Site List

- skin (SCC, BCC, melanoma)
- urogenital (bladder & 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
e) Screening Programmes

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 VERT, videos, journals, texts, newspaper articles and television documentaries will provide a rich source of material for discussion, and exploration.

Assessment of Learning Outcomes

Summative assessment will consist of the following:

- test = 30% of total mark
- group presentation = 30% of total mark
- 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.

RADT216 Radiation Therapy Planning Concepts II

Paper Code	RADT216
Date	July 2021
Points	18
Aim	To enable students to understand the concepts of radiation therapy treatment planning to enable the planning of standard techniques
Recommended Entry Level	Successful completion of RADT123: Radiation Therapy & Oncology I and RADT124: Radiation Therapy Planning Concepts I

Learning outcomes

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

1. demonstrate knowledge and application of calculations used in radiation therapy;
2. demonstrate knowledge, application of principles and concepts of computer planning for critiquing standard techniques;
3. demonstrate an understanding of imaging and anatomy, relevant to computer planning;
4. discuss the effects of radiation on biological systems.

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

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

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:

- assignment = 30% of total mark
- radiobiology test = 20% of total mark
- viva* (60% pass mark) = 50% of total mark

*consists of plan generation and discussion

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

Reassessment

- 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 minimum pass mark of 60%.

PAPER DESCRIPTORS: YEAR THREE

RADT311 Radiation Therapy Practice III

RADT312 Literature Analysis

RADT313 Professional Development

RADT314 Radiation Therapy and Oncology III

RADT315 Radiation Therapy Planning Concepts III

RADT311 Radiation Therapy Practice III

Paper Code	RADT311
Date	June 2021
Points	60
Aim	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
Recommended Entry Level	Successful completion of RADT312, 313, 314 and 315

Learning outcomes

On completion of this paper the successful student will be able to, across three domains: CT, planning and treatment:

1. demonstrate reliable, efficient and safe practice in the work place;
2. demonstrate optimal patient care: assessment, advice and manage patient needs;
3. demonstrate well developed communication skills;
4. demonstrate the ability to work in a healthcare team;
5. demonstrate the ability to identify error and problem solve in the clinical setting;
6. demonstrate reflective practice and utilise coping strategies in the context of illness, grief, death and dying.

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 Verification of information
b) Verbal and non-verbal communication skills
c) Works professionally with appropriate demeanour
d) 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:

- CT assessment = Pass/Fail
- Planning assessment = Pass/Fail
- Treatment assessment = 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.

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

RADT312 Literature Analysis

Paper Code	RADT312
Date	February 2021
Points	12
Aim	For students to critically analyse and report on research using quantitative and qualitative methodologies within the radiation therapy setting
Recommended Entry Level	Satisfactory completion of RADT212: Principles of Research

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

1. formulate research questions in the field of radiation therapy;
2. competently analyse and report on primary research papers addressing a research question in a radiation therapy setting;
3. synthesise multiple primary research papers into a cohesive framework demonstrating understanding of multiple sources;
4. demonstrate understanding of application of research findings to the clinical setting.

Content:

Corresponding to Learning Outcome 1

a) Understanding of different types of research questions than can be asked
b) Formulation of a focused research question including background rationale

Corresponding to Learning Outcome 2

a) Critical analysis of multiple papers (quantitative and/or qualitative) that explore the research area of interest and apply it to the radiation therapy setting

Corresponding to Learning Outcome 3

a) Understanding of how to integrate and synthesise multiple papers into a cohesive literature review

Corresponding to Learning Outcome 4

a) Description of clinical applications of the review findings

Suggested learning and Teaching Approaches

Student centred tutorials

Assessment of Learning Outcomes

Summative assessment will consist of the following:

- initial research question = 10% of total mark
- literature review = 80% of total mark
- clinical application = 10% of total mark

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

RADT313 Professional Development

Paper Code	RADT313
Date	February 2021
Points	12
Aim	To understand the importance of being a flexible radiation therapist who possesses effective interpersonal skills, and an inquiring nature conducive to lifelong learning, in a technology driven environment.
Recommended Entry Level	Successful completion of RADT213: Advanced Healthcare Communication

Learning outcomes

On completion of this paper the successful student will be able to determine a personal and professional vision of the role of a radiation therapist by being able to:

1. analyse and demonstrate appropriate strategies of self-care
2. analyse the roles and responsibilities within the multidisciplinary healthcare team
3. describe relevant medico-legal legislation
4. demonstrate the importance of reflective practice and ongoing professional development
5. understand the importance of future career planning

Content:

Corresponding to Learning Outcome 1

a) Origins and types of stressors in the workplace
b) Strategies to prevent or minimise the effects of stress and burnout such as supervision, peer mentoring, other supports

Corresponding to Learning Outcome 2

a) Communication and teamwork
b) Working in multi-disciplinary teams (IPE)
c) Personal management strategies for dealing with conflict

Corresponding to Learning Outcome 3

a) The National Cancer Programme
b) Relevant legislation
c) MRTB competencies

Corresponding to Learning Outcome 4

a) Lifelong learning
b) CPD
c) Processes of critical reflective practice
d) Social media and professional practice

e) Conferences and journals of relevant professional organisations

Corresponding to Learning Outcome 5

a) Issues relevant to future professional development and career planning

Suggested Learning and Teaching Approaches

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

- seminar presentations 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;
- 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 a critical reflective assignment = 100%

Formative assessment will consist of participation in a communication skills workshop and submission of a written self-reflection; plus, participation in the Interprofessional Education (IPE) component in order to meet coursework requirements (terms).

A pass will be awarded to all students who gain 50% overall and participate in IPE and the communication skills workshop.

RADT314 Radiation Therapy and Oncology III

Paper Code	RADT314
Date	February 2021
Points	14
Aim	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
Recommended Entry Level	Successful completion of RADT215: Radiation Therapy and Oncology II

Learning outcomes

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

1. discuss the oncology of and the clinical rationale for selecting appropriate treatment for the stated 'Site List'(tumours that are commonly treated clinically);
2. analyse the resource implications of managing an oncology department.

Content:

Corresponding to Learning Outcome 1

Site List:

- breast
- lung
- head & neck (oral cavity, pharynx, parotid)
- CNS (astrocytoma/medulloblastoma)
- lymphoma (Hodgkins and non-Hodgkins lymhomas)
- 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 VERT, videos, journals, texts, newspaper articles and television documentaries will provide a rich source of material for discussion, and exploration.

Assessment of Learning Outcomes

Summative assessment will consist of the following:

- test = 30% of total mark
- assignment = 30% of total mark
- 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.

RADT315 Radiation Therapy Planning Concepts III

Paper Code	RADT315
Date	February 2021
Points	22
Aim	To enable students to understand the concepts of radiation therapy treatment planning to plan a range of techniques
Recommended Entry Level	Successful completion of RADT215: Radiation Therapy and Oncology II and RADT216: Radiation Therapy Planning Concepts I

Learning outcomes

On completion of this paper the successful student will be able to demonstrate:

1. knowledge and application of calculations used in radiation therapy;
2. knowledge and performance of principles and concepts of computer planning, and the ability to critically analyse standard radiation therapy technique computer plans
3. consolidation of imaging and anatomy relevant to radiation therapy
4. application of radiobiology to the clinical setting
5. demonstrate an understanding of IMRT and VMAT planning

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
b) 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

Corresponding to Learning Outcome 5

a) Apply computer planning principles and concepts to produce a range of plans. Principles to include:
   - Inverse planning and optimisation
   - ICRU 83
   - Beam angle selection
   - DVH interpretation
   - Organs at risk
   - Beam energy, exit dose
   - Imaging
   - Verification and quality assurance
   - Monitor units

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:

- assignment = 40% of total mark

- radiobiology test = 20% of total mark
- viva (67% pass mark) = 40% of total mark

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

Reassessment

- 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 minimum pass mark of 67%.

Bachelor of Radiation Therapy
Curriculum Document 2021

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