



# University of Pretoria Yearbook 2017

## BRad Diagnostics (10137005)

**Duration of study** 3 years

**Total credits** 420

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### Programme information

Each student in Radiography must apply to the Registrar of the Health Professions Council of South Africa for registration as a student in Radiography immediately after admission to the first year of study. The programme extends over three years' full-time study, during which period a student radiographer will be attached to an institution approved by the Department of Radiography.

Students must comply with the stipulations of the Health Professions Council of South Africa concerning the required number of practical hours and as determined by the Department of Radiography.

### Admission requirements

- The following persons will be considered for admission: a candidate who is in possession of a certificate that is deemed by the University to be equivalent to the required Grade 12 certificate with university endorsement; a candidate who is a graduate from another tertiary institution or has been granted the status of a graduate of such an institution; and a candidate who is a graduate of another faculty at the University of Pretoria.
- Life Orientation is excluded in the calculation of the APS.
- Grade 11 final examination results, the NBT results as well as a Value-added Questionnaire will be used for the provisional admission of prospective students.
- Admission to Health Sciences programmes is subject to a selection process.
- The applications of international candidates who come from countries that have medical schools will not be considered for placement in the MBChB programme except where intergovernmental agreements are in place.
- For selection purposes the sum of the results in six subjects, including English, Mathematics and Physical Science, is calculated.
- Candidates, please note that your APS may not drop with more than two points in your final school examination results in order to maintain your provisional admission.
- PLEASE NOTE that compliance with the minimum admission requirements does not necessarily guarantee admission to any programme in this Faculty.
- Selection queries may be directed to [healthapplications@up.ac.za](mailto:healthapplications@up.ac.za).

Minimum requirements



Achievement level												APS
English				Mathematics				Physical Science				
NSC/IEB	HIGCSE	AS-Level	A-Level	NSC/IEB	HIGCSE	AS-Level	A-Level	NSC/IEB	HIGCSE	AS-Level	A-Level	
4	3	D	D	4	3	D	D	4	3	D	D	25

## Examinations and pass requirements

### Subminimum

A subminimum of 40% is required in the written as well as the practical/clinical sections of the examination in Radiography at 100, 200 and 300 level.

- In accordance with the stipulations of the General Regulations, no minimum year or semester mark is needed for admission to the examination, and all registered students are admitted to the examination automatically.
- The final mark for a specific module in Nursing Science, Physiotherapy, Radiography, Occupational Therapy and Human Nutrition (at least 50% is required to pass) is calculated from the examination mark as well as the mark compiled from the evaluation of a student during continuous, objective and controlled assessment opportunities during the course of the quarter/semester/year. At least one formal assessment per module is set as the minimum norm, and students will be exposed on a continuous and regular basis to self-directed assignments in order to promote reflective learning.
- In the case of modules with practical components, students are required to also comply with the applicable attendance requirements with regard to acquiring practical skills before a pass mark can be obtained for the module.
- There are two main examination opportunities per annum, the first and second examination. In respect of first-semester modules, the first examination opportunity is in May/June and the second examination opportunity in July. In respect of second-semester modules, the first examination opportunity is in October/ November and the second examination opportunity in November/December of the same year. Where students need to work additional clinical hours to be allowed to do a second examination, the Head of Department will determine the second examination opportunity.
- Only two examination opportunities per module are allowed. If a student fails a module at the second examination opportunity, the module must be repeated.
- A second examination opportunity in a module is granted to students in the following cases:
  - If a student obtains a final mark of less than 50% in the relevant module at the first examination opportunity and thus fails.
  - If a student does not obtain the subminimum in the examination, as required for a specific module.
  - If a student does not sit the examination in a module at the first examination opportunity due to illness or extraordinary circumstances.
- Students intending to sit the second examination due to the reasons mentioned above, must register for the second examination opportunity 24 hours after the results have been made public.
- If a student fails a module at the first examination opportunity, the examination mark obtained in the relevant module at the second examination opportunity will be calculated as the final mark. The marks obtained with continuous evaluation during the course of the quarter/semester/year will not be taken into calculation. If the



student passes the module at the second examination opportunity, a maximum of 50% is awarded as a pass mark to the module in question.

- If a student could not sit the examination in a module at the first examination opportunity due to illness or extraordinary circumstances, the continuous evaluation mark, together with the examination mark obtained in the module in question at the second examination opportunity, will be calculated as the final mark obtained in the module.
- The School of Healthcare Sciences applies the General Regulations, according to which a student requiring a limited number of modules to complete his or her degree, may in terms of faculty regulations, be admitted to a special examination in the modules in question.

## Promotion to next study year

- A student must pass in all the prescribed core modules of a specific year of study to be promoted to a subsequent year of study. A student can only be promoted to a subsequent year of study if the student has not failed more than two fundamental modules of seven weeks each per semester or one module of 14 weeks per semester. A non-negotiable prerequisite for admission to the final year of study is pass marks in all the core and fundamental modules of the preceding years of study. Refer to the programmes for fundamental modules in each discipline.
- A pass mark refers to a final mark of at least 50%.
- Modules with practical and clinical training credits cannot be passed unless all the prescribed clinical hours and practical activities have been completed to the satisfaction of the head of department.
- The Chairperson of the examination moderating meeting may, after assessing the student's total profile, grant special approval to be promoted to the next year of study.
- The exception is the Department of Human Nutrition, where the regulations as applicable in the Faculty of Natural and Agricultural Sciences regarding the modules presented by that Faculty, are relevant.
- Modules can only be taken in advance or repeated if it can be accommodated in the existing examination timetable.
- A student who must repeat a year of study may, with the approval of the Chairperson of the examination moderating meeting and the head of department concerned, be allowed to take fundamental modules of the subsequent year, if he/she complies with all the prerequisites for the relevant modules. No adjustment to existing timetables will be allowed.

The following fundamental modules are relevant:

- Department of Nursing Science: SLK 110, 120; FSG 251,252
- Department of Physiotherapy: SOH 254; FSG 251, 252, 261, 262; SLK 210, ANP 210; GMB 252, 253, 254; FAR 381, 382
- Department of Occupational Therapy: ZUL 110; SEP 110; SLK 210, 220; FSG 251, 252, 261, 262; ANP 210; RPD 481, GNK 286
- Department of Human Nutrition: FLG 211, 212, 221, 222; BCM 251, 252, 261, 262; FAR 381, 382, VDS 322; VDB 321
- Department of Radiography: FSG 251, 252, 262; GNK 286; ANP 210.

## Pass with distinction

The degree is conferred with distinction on a student who has obtained an average of at least 75% in the final-year modules.



## Curriculum: Year 1

**Minimum credits: 163**

Choose between Sepedi and Zulu.

### Fundamental modules

#### Physiology 161 (FSG 161)

**Module content:**

Introduction to physiological principles; neurophysiology, and muscle physiology.

**Module credits** 12.00

**Prerequisites** No prerequisites.

**Contact time** 4 lectures per week, 1 practical per week

**Language of tuition** Afrikaans and English is used in one class

**Academic organisation** Physiology

**Period of presentation** Quarter 3

#### Physiology 162 (FSG 162)

**Module content:**

Body fluids; haematology; cardiovascular physiology, lymphatic system, and body defence mechanisms.

**Module credits** 12.00

**Prerequisites** No prerequisites.

**Contact time** 4 lectures per week, 1 practical per week

**Language of tuition** Afrikaans and English is used in one class

**Academic organisation** Physiology

**Period of presentation** Quarter 4

#### Medical terminology 180 (MTL 180)

**Module content:**

The acquisition of a basic medical orientated vocabulary compiled from Latin and Greek stem forms combined with prefixes and suffixes derived from those languages. The manner in which the meanings of medical terms can be determined by analysing the terms into their recognisable meaningful constituent parts, is taught and exercised. The functional use of medical terms in context as practical outcome of terminological application is continually attended to.

**Module credits** 12.00



<b>Service modules</b>	Faculty of Health Sciences Faculty of Natural and Agricultural Sciences Faculty of Veterinary Science
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 lectures per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Ancient Languages and Cultures
<b>Period of presentation</b>	Semester 1 and Semester 2

## Radiographic anatomy 100 (RAN 100)

### Module content:

General introduction to anatomy: Anatomical terminology, surface and regional anatomy, histology of basic tissues; ossification, healing and repair. Introduction to osteology. Regional anatomy I: Thoracic skeleton and thoracic soft tissues; osteology; joints and soft tissues of the extremities; osteology and joints of the vertebral column; abdominal surface anatomy; osteology and soft tissue of the pelvis. Skull I: Cranium and facial bones. Radiographic anatomy I: Regional radiographic anatomy, with emphasis on the skeletal components.

<b>Module credits</b>	20.00
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	1 practical per week, 2 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Academic organisation</b>	Anatomy
<b>Period of presentation</b>	Year

## Radiation physics 110 (RFI 110)

### Module content:

Units: converting, dimensional analysis. Mechanics: momentum, force, energy, circular motion, moment of inertia, angular momentum, simple harmonic motion. Electrostatics: Coulomb's law, electric field, potential. Direct currents: resistors, Ohm's law. Capacitors: capacitance, series, parallel energy. Magnetism: force on a moving charge, electric motor. Electromagnetic induction: Faraday's law, Lenz's Law, generators. Alternating currents: average and rms value, three phase, rectification, transformers. Electrical safety. Atomic structure: ionization, excitation. X-rays: production, absorption.

<b>Module credits</b>	10.00
<b>Service modules</b>	Faculty of Health Sciences
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 lectures per week



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<b>Language of tuition</b>	Separate classes for Afrikaans and English
<b>Academic organisation</b>	Physics
<b>Period of presentation</b>	Year

### Sepedi for beginners 110 (SEP 110)

#### Module content:

\*For absolute beginners only.

\*Only students from the School of Healthcare Sciences may take this module during semester 2. All other students must take this module during semester 1. Also note that students from the School of Healthcare Sciences, who already possess the language skills taught in this module, may write an exemption examination. The acquisition of basic Sepedi communicative skills with emphasis on everyday expressions and suitable high frequency vocabulary, within specific social situations.

<b>Module credits</b>	12.00
<b>Service modules</b>	Faculty of Education Faculty of Health Sciences
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 lectures per week, 1 discussion class per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	African Languages
<b>Period of presentation</b>	Semester 1 and Semester 2

### isiZulu for beginners 110 (ZUL 110)

#### Module content:

\*For absolute beginners only

\*Only students from the School of Healthcare Sciences may take this module during semester 2. All other students must take this module during semester 1. Students from the School of Healthcare Sciences, who already possess the language skills taught in this module, may write an exemption examination. The acquisition of basic isiZulu communicative skills with emphasis on everyday expressions and suitable high frequency vocabulary, within specific situations.

<b>Module credits</b>	12.00
<b>Service modules</b>	Faculty of Education Faculty of Health Sciences
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	1 discussion class per week, 2 lectures per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	African Languages



**Period of presentation** Semester 1 and Semester 2

## Academic information management 101 (AIM 101)

### Module content:

Find, evaluate, process, manage and present information resources for academic purposes using appropriate technology. Apply effective search strategies in different technological environments. Demonstrate the ethical and fair use of information resources. Integrate 21st-century communications into the management of academic information.

**Module credits** 6.00

### Service modules

Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education  
Faculty of Economic and Management Sciences  
Faculty of Humanities  
Faculty of Law  
Faculty of Health Sciences  
Faculty of Natural and Agricultural Sciences  
Faculty of Theology  
Faculty of Veterinary Science

**Prerequisites** No prerequisites.

**Contact time** 2 lectures per week

**Language of tuition** Separate classes for Afrikaans and English

**Academic organisation** Information Science

**Period of presentation** Semester 1

## Academic English for Health Sciences (BCur, BDietetics, BOH, BOccTher, BRad and BPhysT) 121 (ELH 121)

### Module content:

Academic reading as well as academic writing and presentation skills, based on the approach followed in the healthcare sciences. *\*Presented to students in Health Sciences only.*

**Module credits** 6.00

**Service modules** Faculty of Health Sciences

**Prerequisites** No prerequisites.

**Contact time** 1 discussion class per week, 2 lectures per week

**Language of tuition** Module is presented in English

**Academic organisation** Unit for Academic Literacy

**Period of presentation** Semester 1



## Academic English for Health Sciences122 (ELH 122)

### Module content:

Study of specific language skills required in the Health Care Sciences, including interviewing and report-writing skills. \*Presented to students in Health Sciences only. (BCur, BDietetics, BOH, BOT, Brad, BPhysT)\*

<b>Module credits</b>	6.00
<b>Service modules</b>	Faculty of Health Sciences
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 lectures per week, 1 discussion class per week
<b>Language of tuition</b>	Module is presented in English
<b>Academic organisation</b>	Unit for Academic Literacy
<b>Period of presentation</b>	Semester 2

## Academic orientation 110 (UPO 110)

<b>Module credits</b>	0.00
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Health Sciences Dean's Office
<b>Period of presentation</b>	Year

## Core modules

### Radiographic imaging 186 (RAW 186)

#### Module content:

Introduction: Discovery of X-rays, processing principles, handling of X-ray equipment. X-beam: production of X-rays, attenuation.

Properties of the radiographic image: visibility and geometric properties.

Image formation: interaction between X-rays and the human body and subject contrast.

Primary exposure factors: mAs, kVp and SID. AEC. Principles of technique charts. Image recording: darkrooms, cassettes, intensifying screens, efficiency of rare earth intensifying screens and X-ray film construction.

Control of scatter radiation: production of scatter, effect of scattered radiation on the image, beam restriction devices, grids and grid efficiency.

Geometry: focal spot size, SID, OID, X-ray beam/body part/film alignment, influence of distances and other variables on the geometric properties of the image. Introduction to digital radiography.

<b>Module credits</b>	19.00
<b>Contact time</b>	1 discussion class per week, 1 lecture per week, 1 seminar per week
<b>Language of tuition</b>	Separate classes for Afrikaans and English
<b>Academic organisation</b>	Radiography
<b>Period of presentation</b>	Year





## Radiography 185 (RAW 185)

### Module content:

(a) Introduction to radiography. Concepts of ethics, profession and professionalism. Professional standards in radiography. Communication skills: interpersonal and scientific. Radiation protection concepts and equipment. Principles of infection control. Radiographic procedures and positioning principles. Care of the patient. Pathological condition. Related imaging modalities.

(b) Patients with special problems. Handling of paediatric patients and geriatric patients.

(c) Radiographic examinations: thorax, abdomen, extremities, hip, pelvis, spine and skull. Theoretical and practical instruction is used to integrate basic sciences and clinical radiography. Procedural considerations and positioning techniques. Selection of technique factors. Radiation protection. Pathological conditions and film evaluation. Problem-solving. Execution of radiographic examinations and procedures. Trauma.

**Module credits** 48.00

**Contact time** 1 lecture per week, 1 seminar per week, 4 discussion classes per week

**Language of tuition** Module is presented in English

**Academic organisation** Radiography

**Period of presentation** Year



## Curriculum: Year 2

**Minimum credits: 133**

### Fundamental modules

#### Physiology 251 (FSG 251)

**Module content:**

Structure, gas exchange and secretory functions of the lungs; build, excretory and non-urinary functions of the kidneys, acid-base balance, as well as the skin and body temperature control.

Practical work: lung functions/spirometry, kidney function tests – side-room urine examinations. Digestion. Metabolism. Pathophysiology.

<b>Module credits</b>	6.00
<b>Prerequisites</b>	RAN 100, RFI 110, FSG 161, FSG 162, MTL 180, RAW 180, RAW 182
<b>Contact time</b>	4 lectures per week, 1 practical per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Physiology
<b>Period of presentation</b>	Quarter 1

#### Physiology 252 (FSG 252)

**Module content:**

Nutrition, digestion and metabolism, hormonal control of body functions and the reproductive systems.

Practical work: endocrine system, reproductive system, pregnancy test.

<b>Module credits</b>	6.00
<b>Prerequisites</b>	RAN 100,RFI 110,FSG 161,FSG 162,RAW 180,RAW 182,MTL 180,
<b>Contact time</b>	4 lectures per week, 1 practical per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Physiology
<b>Period of presentation</b>	Quarter 2

#### Physiology 262 (FSG 262)

**Module content:**

Applied pathophysiology.

<b>Module credits</b>	6.00
<b>Prerequisites</b>	RAN 100, RFI 110, FSG 161, FSG 162, RAW 180, RAW 182, MTL 180
<b>Contact time</b>	3 lectures per week



<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Physiology
<b>Period of presentation</b>	Quarter 4

### Basic emergency care 286 (GNK 286)

#### Module content:

Theory and practical training in basic emergency care.

<b>Module credits</b>	5.00
<b>Prerequisites</b>	CMY 151,FIL 155,MGW 112,MLB 111,PHY 131,MTL 180,GNK 120,BOK 121,GNK 127,GNK 128,CIL 111 and 121 or AIM 101 or AIM 111 and 121 EOT 110 and 120 or ELH 111 and 112
<b>Contact time</b>	8 practicals per week, 1 other contact session per week
<b>Language of tuition</b>	Separate classes for Afrikaans and English
<b>Academic organisation</b>	Health Sciences Dean's Office
<b>Period of presentation</b>	Semester 1 and/or 2

### Radiographic anatomy 280 (RAN 280)

#### Module content:

Systemic anatomy I: Digestive and urogenital systems. Sensory organs: Skin; eye; ear; nose; tongue. Skull II: Advanced osteology; base of cranium; openings and sinuses. Radiographic anatomy II: Systemic anatomy with emphasis on soft tissue components.

<b>Module credits</b>	10.00
<b>Prerequisites</b>	RFI 110,MTL 180,RAN 100,FSG 161,FSG 162,RAW 182,RAW 180
<b>Contact time</b>	1 other contact session per week, 1 discussion class per week, 2 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Academic organisation</b>	Anatomy
<b>Period of presentation</b>	Semester 1

### Radiation physics 210 (RFI 210)

#### Module content:

X-ray generator: transformer, energy losses, rectifiers, capacitor-discharge systems, kVp and mA control, high voltage cables. Image intensifiers: design, brightness gain, coupling systems. TV camera and monitor: design, video signal, scanning. Image quality. Optics: reflection, refraction, total internal reflection, mirrors, lenses, thin lens formula, lens aberrations, fibre optics, lasers, laser camera. Computers: basic hardware, digital principles and terminology, data storage.



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<b>Module credits</b>	10.00
<b>Service modules</b>	Faculty of Health Sciences
<b>Prerequisites</b>	RFI 110, MTL 180, RAN 100, FSG 161, FSG 162, RAW 182 and RAW 180
<b>Contact time</b>	3 lectures per week
<b>Language of tuition</b>	Module is presented in Afrikaans
<b>Academic organisation</b>	Physics
<b>Period of presentation</b>	Semester 1

## Radiation physics 211 (RFI 211)

### Module content:

Radio-active decay: half-life, alfa decay, beta decay, gamma decay. Production of isotopes cyclotron, nuclear reactor, Van de Graaff accelerator. Absorption: nucleons, alfa particles, beta particles. Dosimetry: exposure, absorbed dose, equivalent dose, effective dose, dose limits. Radiation detectors: Geiger counter, scintillation counter, thermoluminescent detector, semi-conductor detectors. Radiopharmaceuticals. Biological effects: genetic and somatic effects.

<b>Module credits</b>	10.00
<b>Service modules</b>	Faculty of Health Sciences
<b>Prerequisites</b>	RFI 110, RAW 180, RAN 100, FSG 161, FSG 162, RAW 182 and MTL 180
<b>Contact time</b>	4 lectures per week
<b>Language of tuition</b>	Module is presented in Afrikaans
<b>Academic organisation</b>	Physics
<b>Period of presentation</b>	Semester 2

## Core modules

### Radiography 280 (RAW 280)

#### Module content:

Skeletal system: Procedures and techniques for: positioning, patient care, selection of technique factors, radiation protection, pathological conditions and film evaluation. Problem-solving. Execution of radiographic examinations and procedures. Trauma. Alternative imaging and film principles and procedures. Apparatus. Radiation protection.

Radiographic procedures: Execution of radiographic examinations and procedures, selection of technique factors, radiation protection, problem-solving, pathological conditions and film evaluation for neonatal and mobile unit procedures. Orthopaedic theatre procedures. Soft tissue contrast media examinations. Applied nursing sciences. Research principles

Practical implementation: Compilation of a portfolio. Theoretical and practical tuition are used to integrate science and clinical radiography.



<b>Module credits</b>	54.00
<b>Prerequisites</b>	RAN 100,RFI 110,FSG 161,FSG 162,RAW 180,RAW 182,MTL 180
<b>Contact time</b>	1 lecture per week, Community Engagement, 3 discussion classes per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Radiography
<b>Period of presentation</b>	Year

## Radiographic imaging 282 (RAW 282)

### Module content:

Film evaluation. Application of technique factors, compiling of technique charts. Films, film technology, image formation and sensitometric properties. Processing, monitoring the processor and processing area. Darkroom and design, chemicals. Quality assurance tests. Digital radiography: image formation and processing.

<b>Module credits</b>	20.00
<b>Prerequisites</b>	RAN 100,RFI 110,FSG 161,FSG 162,RAW 180,RAW 182,MTL 180
<b>Contact time</b>	1 discussion class per week, 1 lecture per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Radiography
<b>Period of presentation</b>	Year

## Radiation therapy and nuclear medicine 284 (RAW 284)

### Module content:

(a) Radiobiology: Cell survival curves and target theories, radiation effects on tissue, tissue and organ radio sensitivity. Radiation pathology, acute and chronic effects, late effects of radiation. Clinical radiobiology: Radiation therapy, tumour radiobiology, fractionation, iso-effect formulae. (b) Introduction to radiation therapy: Origin and incidence of cancer, diagnoses and staging, treatment and modalities. Treatment methods in radiation therapy. Preparation for external beam irradiation. Dosage. Biological principles of radiation. Effects of radiation on normal tissue. (c) Introduction to nuclear medicine: Principles of nuclear physics and nuclear medicine, nuclear instrumentation, radio chemical pharmacology. Basic approach to clinical nuclear medicine and relevant techniques.

<b>Module credits</b>	10.00
<b>Prerequisites</b>	RAN 100,RFI 110,FSG 161,FSG 162,RAW 180,RAW 182,MTL 180
<b>Contact time</b>	1 discussion class per week, 1 lecture per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Radiography



**Period of presentation** Quarter 4

## Radiographic imaging 286 (RAW 286)

### Module content:

Film evaluation. Application of technique factors, compiling of technique charts.

Films, film technology, image formation and sensitometric properties.

Processing, monitoring the processor and processing area.

Darkroom and design, chemicals.

Quality assurance tests.

Digital radiography: image formation and processing.

**Module credits** 19.00

**Prerequisites** RAN 100, RFI 110, FSG 161, FSG 162, RAW 185, RAW 186, MTL 180

**Contact time** 1 lecture per week, 1 discussion class per week

**Language of tuition** Afrikaans and English is used in one class

**Academic organisation** Radiography

**Period of presentation** Year

## Radiography 285 (RAW 285)

### Module content:

Skeletal system: Procedures and techniques for: positioning, patient care, selection of technique factors, radiation protection, pathological conditions and film evaluation. Problem-solving. Execution of radiographic examinations and procedures. Trauma. Alternative imaging and film principles and procedures. Apparatus. Radiation protection.

Radiographic procedures: Execution of radiographic examinations and procedures, selection of technique factors, radiation protection, problem-solving, pathological conditions and film evaluation for neonatal and mobile unit procedures. Orthopaedic theatre procedures. Soft tissue contrast media examinations. Applied nursing sciences. Research principles

Practical implementation: Compilation of a portfolio. Theoretical and practical tuition are used to integrate science and clinical radiography.

**Module credits** 52.00

**Prerequisites** RAN 100, RFI 110, FSG 161, FSG 162, RAW 185, RAW 186, MTL 180

**Contact time** Community Engagement, 3 discussion classes per week, 1 lecture per week

**Language of tuition** Afrikaans and English is used in one class

**Academic organisation** Radiography

**Period of presentation** Year



## Radiation therapy and nuclear medicine 287 (RAW 287)

### Module content:

(a) Radiobiology: Cell survival curves and target theories, radiation effects on tissue, tissue and organ radio sensitivity. Radiation pathology, acute and chronic effects, late effects of radiation. Clinical radiobiology: Radiation therapy, tumour radiobiology, fractionation, iso-effect formulae.

(b) Introduction to radiation therapy: Origin and incidence of cancer, diagnoses and staging, treatment and modalities. Treatment methods in radiation therapy. Preparation for external beam irradiation. Dosage. Biological principles of radiation. Effects of radiation on normal tissue.

(c) Introduction to nuclear medicine: Principles of nuclear physics and nuclear medicine, nuclear instrumentation, radio chemical pharmacology. Basic approach to clinical nuclear medicine and relevant techniques.

**Module credits** 9.00

**Prerequisites** RAN 100, RFI 110, FSG 161, FSG 162, RAW 185, RAW 186, MTL 180

**Contact time** 1 lecture per week, 1 discussion class per week

**Language of tuition** Afrikaans and English is used in one class

**Academic organisation** Radiography

**Period of presentation** Quarter 4



## Curriculum: Final year

**Minimum credits: 124**

### Fundamental modules

#### Anatomical pathology 210 (ANP 210)

**Module content:**

General principles of pathology, including necroses, reversible cell damage, reparation and abnormalities of growth, circulation disturbances, acute and chronic infections, classification of the spreading of tumours and carcinogenesis. Directed course in systematic pathology, with specific reference to cardiovascular system, respiratory system, locomotor system and neuropathology.

**Module credits** 10.00

**Prerequisites** [PHY 131, CMY 151, FSG 161, FSG 162, FTP 100, ANA 152, ANA 162] or [FSG 251, FSG 252, FSG 261, FSG 262, AKU 200, ART 282, ART 284, RPD 200, ART 281, ART 283] or [RAN 280, RAW 281, RAW 282, RAW 283]

**Contact time** 1 seminar per week, 2 lectures per week

**Language of tuition** Separate classes for Afrikaans and English

**Academic organisation** Anatomical Pathology

**Period of presentation** Semester 1

#### Radiographic anatomy 380 (RAN 380)

**Module content:**

Systemic anatomy II: Female reproductive system and breast; Cardiovascular system; Cerebrospinal fluid system. Introduction to neuroanatomy.

Regional cross-sectional anatomy: Cranium, brain; thorax; abdomen; pelvis and limbs.

Radiographic anatomy III: Systemic and cross-sectional anatomy with emphasis on three-dimensional reconstruction.

**Module credits** 10.00

**Prerequisites** RFI 210, RFI 211, RAN 280, FSG 251, FSG 252, FSG 262

**Contact time** 2 lectures per week, 1 practical per week, 1 discussion class per week

**Language of tuition** Module is presented in English

**Academic organisation** Anatomy

**Period of presentation** Year

#### Radiation physics 310 (RFI 310)

**Module content:**

Computed tomography: CT generations. Equipment: x-ray tube, collimators, detectors. Image reconstruction:





fundamental equations, algorithms.

Image properties: field size, image matrix, voxel, pixel, CT number, window width and height. Image quality: spatial resolution, contrast resolution, quantum mottle, spatial uniformity and frequency. Image processing: edge enhancement, pixel shifting and subtraction. Digital radiography: X-ray, equipment, analogue to digital conversion, linear and logarithmic subtraction, image noise. Ultrasound: theory, transducers, piezo-electric crystals, resonant frequency, interaction with matter, acoustic impedance, Doppler techniques. Magnetic resonance: medical applications.

<b>Module credits</b>	10.00
<b>Service modules</b>	Faculty of Health Sciences
<b>Prerequisites</b>	FSG 251, RFI 210, RAW 281, RBG 281, RAN 280, RAW 282, FSG 252, FSG 262, RAW 284 and RFI 211
<b>Contact time</b>	3 lectures per week
<b>Language of tuition</b>	Module is presented in Afrikaans
<b>Academic organisation</b>	Physics
<b>Period of presentation</b>	Semester 1

## Research in healthcare sciences 480 (RHC 480)

### Module content:

Research in healthcare sciences:

- Understanding the importance of evidence-based clinical practice.
- Understanding the research process and general approaches to research.
- Knowledge of the methodologies commonly used in healthcare sciences.
- Reading and critiquing published research.
- Writing a literature review.
- Understanding and respecting research ethics and the criteria for good quality research.

<b>Module credits</b>	16.00
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	3 lectures per week, 2 web-based periods per week, 1 other contact session per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Physiotherapy
<b>Period of presentation</b>	Semester 1

## Core modules

### Radiography 380 (RAW 380)

#### Module content:



Cardiovascular system: Imaging equipment: laser imager and dry film imager, construction, operation and films. Digital subtraction and image manipulation, viewing, recording and storing of images. Principles and equipment considerations for cardioangiography and angiography. Selective angiography. Intervention techniques (vascular and non-vascular). Venography. Seldinger technique, contrast media, medication, catheters, guide wires and accessories. Quality assurance and quality control. Patient care. Medico-legal aspects. Research. Case presentations. Pattern recognition. Clinical experience and evaluation. Clinical evaluation of an excretory urogram that was done theoretically in the 2nd year. Mammography: Introduction. Principles of soft tissue radiography. Communication and health promotion. Medico-legal aspects. Management of breast disease, patient care and treatment options. Mammography equipment, radiation safety and technique factors. Image receptors. Processing requirements. Positioning principles and special procedures. Systematic evaluation of the images. Different modalities or equipment to demonstrate the breast. Quality assurance and quality control. Case presentation. Research. Pattern recognition. Clinical experience and evaluation. Hysterosalpingography: Booking procedures, patient-radiographer relationship, procedural considerations and evaluation criteria. Pattern recognition. Bone densitometry: Principles, bone biology and remodelling, osteoporosis, core competencies for radiographers, physical principles of dual X-ray absorptiometry and other bone densitometry techniques. Clinical experience. Ultrasound: General principles. Clinical experience. Computer Tomography: Imaging principles – conventional and spiral. Factors affecting image quality. Contrast media. Protocol for different examinations. Patient care. Case presentation. Research. Pattern recognition. Clinical experience and evaluation. Magnetic resonance imaging: Imaging principles and image characteristics. Contrast media. Protocol for the different examinations. Patient care. Clinical experience. Myelography. Research project. Clinical evaluation and film evaluation of examinations that were done theoretically in the first and second year.

<b>Module credits</b>	52.00
<b>Prerequisites</b>	FSG 251,FSG 252,FSG 262,GNK 286,RAN 280,RAW 281,RAW 282,RAW 283,RBG 281,RFI 210
<b>Contact time</b>	4 discussion classes per week, 1 lecture per week, 1 seminar per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Radiography
<b>Period of presentation</b>	Year

## Radiography practice 382 (RAW 382)

### Module content:

Ethics. Law as applied to radiography. Health care. Healthcare delivery. Systems. Health policy (national and international).

Planning of health facilities and services.

General management principles as applied to a radiography department. Purchase specifications processors and basic x-ray equipment. Comparison for clinical use. Accepting criteria.

Radiation safety: Simplifying and standardizing technique. Radiation protection and control (personnel and patients).

Quality assurance: Introduction. Quality patient care and assessment. Reject film analysis and research report.



Quality control tests and corrective action.

Film evaluation.

<b>Module credits</b>	30.00
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	1 seminar per week, 2 discussion classes per week, 1 lecture per week
<b>Language of tuition</b>	Afrikaans and English is used in one class
<b>Academic organisation</b>	Radiography
<b>Period of presentation</b>	Year

## Radiography 383 (RAW 383)

### Module content:

Cardiovascular system: Imaging equipment: laser imager and dry film imager, construction, operation and films. Digital subtraction and image manipulation, viewing, recording and storing of images. Principles and equipment considerations for cardioangiography and angiography. Selective angiography. Intervention techniques (vascular and non-vascular). Venography. Seldinger technique, contrast media, medication, catheters, guide wires and accessories. Quality assurance and quality control. Patient care. Medico-legal aspects. Research. Case presentations. Pattern recognition. Clinical experience and evaluation.

Clinical evaluation of an excretory urogram that was done theoretically in the 2nd year.

Mammography: Introduction. Principles of soft tissue radiography. Communication and health promotion. Medico-legal aspects. Management of breast disease, patient care and treatment options. Mammography equipment, radiation safety and technique factors. Image receptors. Processing requirements. Positioning principles and special procedures. Systematic evaluation of the images. Different modalities or equipment to demonstrate the breast. Quality assurance and quality control. Case presentation. Research. Pattern recognition. Clinical experience and evaluation.

Hysterosalpingography: Booking procedures, patient-radiographer relationship, procedural considerations and evaluation criteria. Pattern recognition.

Bone densitometry: Principles, bone biology and remodelling, osteoporosis, core competencies for radiographers, physical principles of dual X-ray absorptiometry and other bone densitometry techniques. Clinical experience.

Ultrasound: General principles. Clinical experience.

Computer Tomography: Imaging principles – conventional and spiral. Factors affecting image quality. Contrast media. Protocol for different examinations. Patient care. Case presentation. Research. Pattern recognition.

Clinical experience and evaluation.

Magnetic resonance imaging: Imaging principles and image characteristics. Contrast media. Protocol for the different examinations. Patient care. Clinical experience. Myelography.

Research project.

Clinical evaluation and film evaluation of examinations that were done theoretically in the first and second year.

<b>Module credits</b>	50.00
<b>Prerequisites</b>	FSG 251, FSG 252, FSG 262, GNK 286, RAN 280, RAW 281, RAW 286, RAW 283, RBG 281, RFI 210
<b>Contact time</b>	1 seminar per week, 1 lecture per week, 4 discussion classes per week
<b>Language of tuition</b>	Afrikaans and English is used in one class



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**Academic organisation** Radiography

**Period of presentation** Year

## Radiography practice 384 (RAW 384)

### Module content:

Ethics. Law as applied to radiography. Health care. Healthcare delivery. Systems. Health policy (national and international).

Planning of health facilities and services.

General management principles as applied to a radiography department. Purchase specifications processors and basic x-ray equipment. Comparison for clinical use. Accepting criteria.

Radiation safety: Simplifying and standardizing technique. Radiation protection and control (personnel and patients).

Quality assurance: Introduction. Quality patient care and assessment. Reject film analysis and research report.

Quality control tests and corrective action.

Film evaluation.

**Module credits** 28.00

**Contact time** 1 seminar per week, 2 discussion classes per week, 1 lecture per week

**Language of tuition** Afrikaans and English is used in one class

**Academic organisation** Radiography

**Period of presentation** Year

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The information published here is subject to change and may be amended after the publication of this information. The [General Regulations \(G Regulations\)](#) apply to all faculties of the University of Pretoria. It is expected of each student to familiarise himself or herself well with these regulations as well as with the information contained in the [General Rules](#) section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.