University of Pretoria Yearbook 2021

BRad in Diagnostics (10137100)

Department	Radiography
Minimum duration of study	4 years
Total credits	502
NQF level	08

Programme information

The programme extends over four years' full-time study, during which period a student radiographer will be allocated to an institution approved by the Department of Radiography and accredited by the Health Professions Council of South Africa for clinical training in collaboration with the University of Pretoria.

The programme has both an academic and compulsory clinical (work integrated learning) component, with students having to complete specified clinical outcomes for the course in an HPCSA accredited facility. Students must comply with the stipulations of the Health Professions Council of South Africa concerning the required clinical outcomes and as determined by the Department of Radiography.

All students are required to complete specified clinical outcomes as in HPCSA accredited training facilities for each year of study. Students are subject to the rules and regulations of the selected facility in which they are placed for the clinical component of the course, whether in public and/or private health sectors.

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 National Senior Certificate (NSC) 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; a candidate who is a graduate of another Faculty at the University of Pretoria; and a candidate who is currently studying at a university.
- Admission to Health Sciences programmes is subject to a selection process.
- Grade 11 final examination results will be used for the conditional selection of prospective students.
- For selection purposes, the sum of the results in six subjects, including English, Mathematics and Physical Sciences, is calculated.
- Life Orientation is excluded in the calculation of the Admission Point Score (APS).
- **Candidates should note that their conditional admission will be revoked if their APS drops by more than two points in their final school examination results.**
- PLEASE NOTE that compliance with the minimum admission requirements does not guarantee admission to any programme in this Faculty.
- Selection queries may be directed to click here
- A student who is made an offer but does not accept it cannot defer the offer and must reapply to be considered in the following year.

Transferring students (university experience)

- The applications of students who are studying towards a tertiary qualification or have obtained a tertiary qualification must meet the following requirements regarding school subjects and performance levels: They must be in possession of an NSC for degree studies/full exemption certificate and must have attained a performance level of 5 (or 50% HG if completed prior to 2009) for Mathematics and Physical Sciences (or Life Sciences, if required).
- If the subjects were not passed in Grade 12, the equivalent subjects (Physics, Chemistry and Mathematics) must be completed at the tertiary level. University students do not have to submit any non-academic performance record or CV. In their case selection is based on the results attained in the qualification(s) previously completed, ie they will be considered on the basis of their results achieved in higher education.
- The completion of only a three-year diploma or certificate is not considered as university experience, but will be considered in the school-leaver category and admission will be based on the applicant's Grade 12 results.

Qualifications from countries other than South Africa

- A limited number of places are made available to citizens from countries other than South Africa, with those from SADC countries being given preference. Permanent residents of RSA are not categorised as foreign students. Applications from citizens from countries other than South Africa may also be considered if they are:
  - citizens or permanent residents of countries which have relevant government to government agreements with South Africa
  - asylum seekers or refugees

University of Pretoria website click here

Minimum requirements Achievement level English Home Language or English First Additional Language		**Mathematics**		**Physical Sciences**		**APS**
NSC/IEB	AS Level	NSC/IEB	AS Level	NSC/IEB	AS Level	
4	D	4	D	4	D	**30**

* Cambridge A level candidates who obtained at least a D in the required subjects, will be considered for admission. Students in the Cambridge system must offer both Physics AND Chemistry with performance at the level specified for NSC Physical Sciences in the table above.

* International Baccalaureate (IB) HL candidates who obtained at least a 4 in the required subjects, will be considered for admission. Students in the IB system must offer both Physics AND Chemistry with performance at the level specified for NSC Physical Sciences in the table above.

Examinations and pass requirements

Consult the general pass requirements of the School of Healthcare Sciences, for the calculation of the final mark in a module, the continuous assessment mark, obtaining a pass mark in modules with practical and/or clinical components, etc.

Subminimum:
A subminimum of 50% is required in the written, as well as the practical/clinical components sections of the examinations in all modules in Radiographic Sciences at 100, 200, and 300 level.

A second examination opportunity in a module is granted to students in the following cases:
Second examinations are granted according to the stipulations of the general pass requirements of the School of Healthcare Sciences.

Admission to fourth year of study:
A student must pass all the modules of the first, second and third year of study in order to be admitted to the fourth year of study

Special examination: Fourth year of study
A special examination for a student who failed the module; Clinical Practice in Diagnostic Radiography IV. He or she must undergo a further clinical instruction in clinical training areas and obtain at least 50% in the examination

A student who has not obtained a pass mark in the module Research for healthcare sciences 400 must submit an amended essay at a date determined by the head of department.

Promotion to next study year

Consult the general requirements for promotion to a subsequent year of study under the School of Healthcare Sciences, in this publication. Consult also the general pass requirements of the School of Healthcare Sciences for the calculation of the final marking and module, the continuous assessment mark, etc in the learner guides. All modules with practical and clinical training credits cannot be passed, unless all prescribed clinical hours and practical skills have been completed as per module requirement.

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: 144

Choose SEP 119 or ZUL 119.

Fundamental modules

Academic information management 111 (AIM 111)

Module credits	4.00
NQF Level	05
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 and Religion
Prerequisites	No prerequisites.
Contact time	2 lectures per week
Language of tuition	Module is presented in English
Department	Information Science
Period of presentation	Semester 1

Module content

Find, evaluate, process, manage and present information resources for academic purposes using appropriate technology.

Academic information management 121 (AIM 121)

Module credits	4.00
NQF Level	05
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 and Religion Faculty of Veterinary Science
Prerequisites	No prerequisites.
Contact time	2 lectures per week

Language of tuition	Module is presented in English
Department	Informatics
Period of presentation	Semester 2

Module content

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.

Academic English for Health Sciences (BNurs, BDietetics, BOH, BOccTher, BRad and BPhysio) 121 (ELH 121)

Module credits	6.00
NQF Level	05
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
Department	Unit for Academic Literacy
Period of presentation	Semester 1

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.*

Academic English for Health Sciences122 (ELH 122)

Module credits	6.00
NQF Level	05
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
Department	Unit for Academic Literacy
Period of presentation	Semester 2

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)*

Physiology 161 (FSG 161)

Module credits	6.00

NQF Level	05
Prerequisites	No prerequisites.
Contact time	1 practical per week, 4 lectures per week
Language of tuition	Module is presented in English
Department	Physiology
Period of presentation	Quarter 3

Module content

Introduction to physiological principles; neurophysiology, and muscle physiology.

Physiology 162 (FSG 162)

Module credits	6.00
NQF Level	05
Prerequisites	No prerequisites.
Contact time	1 practical per week, 4 lectures per week
Language of tuition	Module is presented in English
Department	Physiology
Period of presentation	Quarter 4

Module content

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

Medical terminology 180 (MTL 180)

Module credits	12.00
NQF Level	05
Service modules	Faculty of Health Sciences Faculty of Natural and Agricultural Sciences Faculty of Veterinary Science
Prerequisites	No prerequisites.
Contact time	2 lectures per week
Language of tuition	Module is presented in English
Department	Ancient and Modern Languages and Cultures
Period of presentation	Semester 1

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.

Radiographic anatomy 100 (RAN 100)

Module credits	20.00
NQF Level	05
Prerequisites	No prerequisites.
Contact time	1 practical per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Anatomy
Period of presentation	Year

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.

Radiation physics 100 (RPH 100)

Module credits	10.00
NQF Level	05
Prerequisites	No prerequisites.
Contact time	1 tutorial per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Physics
Period of presentation	Year

Module content

Units: standards, conversion, dimensional analysis.
Mechanics: simple harmonic motion, rotation, sound wave propagation.
Electricity: electrostatics, electrodynamics.
Electromagnetism: induction, alternating currents, safety.
Atomic physics: atomic models and quantum phenomena, X-rays, particle-wave duality.

Sepedi for beginners 119 (SEP 119)

Module credits	12.00
NQF Level	06
Prerequisites	No prerequisites.
Contact time	1 discussion class per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	African Languages
Period of presentation	Semester 2

Module content

*For absolute beginners only.

* 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.

Academic orientation 110 (UPO 110)

Module credits	0.00
NQF Level	00
Language of tuition	Module is presented in English
Department	Health Sciences Deans Office
Period of presentation	Year

isiZulu 119 (ZUL 119)

Module credits	12.00
NQF Level	06
Prerequisites	No prerequisites.
Contact time	1 discussion class per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	African Languages
Period of presentation	Semester 2

Module content

*For absolute beginners only

* 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.

Core modules

Clinical practice in diagnostic radiography 100 (CDR 100)

Module credits	10.00
NQF Level	05
Prerequisites	No prerequisites.
Contact time	3 discussion classes per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Clinical practice to operationalise and integrate the fundamental theoretical components of the first year of studies. Students will be involved in patient care and communication in diagnostic radiography, undertake operating of diagnostic radiography equipment, whilst practicing health and safety principles in the moving and handling of patients. Students will be allocated to clinical training platforms where patient/public interactions, and interprofessional skills and behaviours are developed.

This module has 10% of the specified clinical training hours necessary to complete specified clinical competencies for the course in an HPCSA accredited facility.

Diagnostic radiography 100 (DIR 100)

Module credits	15.00
NQF Level	05
Prerequisites	No prerequisites.
Contact time	2 discussion classes per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Introduction to radiography.
Fundamental ethical principles; consent and history taking in radiography. Professional roles, responsibilities and codes of conduct. Introduction to communication: interpersonal and scientific. Team work. Reflective processes. Introduction to legislation and the professional bodies related to Radiography practice (national and international).
Care of the patient. Principles of infection control. Pathological conditions. Overview of imaging modalities and procedures. Radiation personnel monitoring – requirements, methods of monitoring, record keeping, responsibility of radiation protection officers. Practical radiation protection- facility design; safety accessory equipment; safety devices.

a. Respecting the human rights of vulnerable patient groups.
b. Basic patient positioning and immobilisation for radiographic examinations. Radiographic examinations: thorax, abdomen, extremities, hip, pelvis, spine and skull. Theoretical and practical instruction is used to integrate basic Science and clinical radiography. Procedural considerations and positioning techniques. Selection of technique factors. Radiation protection. Pathological conditions and image evaluation. Problem-solving. Execution of radiographic examinations and procedures. Trauma.

Introduction to research in health care science – research process.

Integrated healthcare leadership 120 (IHL 120)

Module credits	8.00
NQF Level	05
Service modules	Faculty of Humanities
Contact time	2 lectures per week
Language of tuition	Module is presented in English
Department	Nursing Science
Period of presentation	Semester 2

Module content

Leadership and multidisciplinary team work. Healthcare systems and legislation. Determinants of health. Introduction to healthcare models (e.g. community-based care, family-centred care, etc.). Professionalism, Ethical principles. Management of diversity. NB: Only for School of Healthcare Sciences and Department of Speech-Language Pathology and Audiology students.

Radiation physics 100 (RPH 100)

Module credits	10.00
NQF Level	05
Prerequisites	No prerequisites.
Contact time	1 tutorial per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Physics

Period of presentation	Year

Module content

Units: standards, conversion, dimensional analysis.
Mechanics: simple harmonic motion, rotation, sound wave propagation.
Electricity: electrostatics, electrodynamics.
Electromagnetism: induction, alternating currents, safety.
Atomic physics: atomic models and quantum phenomena, X-rays, particle-wave duality.

Diagnostic radiographic science 100 (RSC 100)

Module credits	15.00
NQF Level	05
Prerequisites	No prerequisites.
Contact time	1 discussion class per week, 1 tutorial per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Introduction: Discovery of x-rays, processing principles, handling of x-ray equipment. x-ray beam: production of x-rays, attenuation.
Properties of X Rays: importance and influence of Bremsstrahlung and Characteristic radiation on Imaging and Dose, Electron Energy, Target Material, Influence of Filtration. X-Ray Projection Imaging Concepts: Geometry, Radiographic Contrast, Scatter and Scatter Reduction (Control of scatter radiation: production of scatter, effect of scattered radiation on the image, beam restriction devices, grids and grid efficiency), Artefacts and Image Degradation.
Radiographic Detectors: Intensifying Screen and Film (, cassettes, intensifying screens, efficiency of rare earth intensifying screens and x-ray film construction), Computed Radiography (CR), Direct Digital Radiography (DDR), Indirect Digital Radiography (IDR).

Principles of conventional and digital radiography image optimisation – Primary exposure factors: mAs, kVp and SID. AEC.(factor which influence the production and recording of images); Principles of technique charts Conventional Image processing: darkrooms Image Representations: Contrast, Spatial Resolution, Noise, Temporal Resolution, Sampling and Quantization
Introduction to quality assurance in radiographic imaging. Introduction to radiation protection for patient, personnel and public- radiation units, detection and measurement, radiation dose equipment and area survey. Regulations and operation of radiation equipment. Introduction to digital imaging system.

Curriculum: Year 2

Minimum credits: 127

Fundamental modules

Anatomical pathology 210 (ANP 210)

Module credits	10.00
NQF Level	06
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	Module is presented in English
Department	Anatomical Pathology
Period of presentation	Semester 1

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 neurophathology.

Physiology 251 (FSG 251)

Module credits	6.00
NQF Level	06
Prerequisites	RAN 100, RFI 110, FSG 161, FSG 162, MTL 180, RAW 180, RAW 182
Contact time	1 practical per week, 4 lectures per week
Language of tuition	Module is presented in English
Department	Physiology
Period of presentation	Quarter 1

Module content

Structure, gas exchange and secretory functions of the lungs; structure, excretory and non-urinary functions of the kidneys, acid-base balance, and skin and body temperature control. Practical work to complement the theory.

Physiology 252 (FSG 252)

Module credits	6.00
NQF Level	06
Prerequisites	RAN 100,RFI 110,FSG 161,FSG 162,RAW 180,RAW 182,MTL 180,

Contact time	1 practical per week, 4 lectures per week
Language of tuition	Module is presented in English
Department	Physiology
Period of presentation	Quarter 2

Module content

Nutrition, digestion and metabolism, hormonal control of body functions, and the reproductive systems. Practical work to complement the theory.

Physiology 262 (FSG 262)

Module credits	6.00
NQF Level	06
Prerequisites	RAN 100, RFI 110, FSG 161, FSG 162, RAW 180, RAW 182, MTL 180
Contact time	3 lectures per week
Language of tuition	Module is presented in English
Department	Physiology
Period of presentation	Quarter 4

Module content

Applied pathophysiology.

Basic emergency care 286 (GNK 286)

Module credits	5.00
NQF Level	06
Prerequisites	(does not apply to the BOH programme) 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
Contact time	2 other contact sessions per week, 4 practicals per week
Language of tuition	Module is presented in English
Department	Health Sciences Deans Office
Period of presentation	Semester 1

Module content

This practical-orientated module will provide students with training in basic life support, automated external defibrillation, and first aid treatment to the suddenly ill or injured patient. The theoretical content will be offered in an interactive format where students are expected to master the content as self-directed learning. Practical skills will be demonstrated in the skills laboratory and students will get the opportunity to practice the skills under guidance and supervision.

Radiographic anatomy 280 (RAN 280)

Module credits	10.00
NQF Level	06
Prerequisites	RFI 110,MTL 180,RAN 100,FSG 161,FSG 162,RAW 182,RAW 180
Contact time	1 discussion class per week, 1 other contact session per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Anatomy
Period of presentation	Semester 1

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.

Radiation physics 200 (RPH 200)

Module credits	20.00
NQF Level	06
Prerequisites	RPH 100
Contact time	3 lectures per week
Language of tuition	Module is presented in English
Department	Physics
Period of presentation	Year

Module content

X-ray generation: atomic physics, thermodynamics, X-ray tubes, linear accelerators.

Image formation and recording: optics, image intensifiers, solid state physics, digital imaging display and storage systems, image quality and patient dose.

Radioactivity: nuclear nomenclature, half-life, activity, decay modes and nuclear processes, nuclide chart and decay.

Production of radioisotopes: Nuclear reactions, production facilities (cyclotrons, reactors, and accelerators).

Interactions of ionising radiation with matter: charged particles, neutrons, photons, attenuation coefficients, photo-electric Compton contribution.

Radiation Detection: detectors (Geiger, scintillation, TLD, semiconductor, ionisation chamber), counting (spectroscopy, efficiency, statistics), protection.

Dosimetry: units, exposure, dose, absorbed dose, equivalent dose, effective dose, dose limits.

Core modules

Clinical practice in diagnostic radiography 200 (CDR 200)

Module credits	10.00
NQF Level	06
Prerequisites	CDR 100, RSC 100, IHL 120, DIR 100
Contact time	3 discussion classes per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Clinical practice to operationalise and integrate the fundamental theoretical components of the second year of studies and to build on the competencies developed in the first year of study. Aspects covered within this module include the use of fluoroscopy, with emphasis placed on radiation protection of patients, public and personnel.

Note:
This module comprises 25% of the specified clinical training hours necessary to complete specified clinical competencies for the course in an HPCSA accredited facility.

Diagnostic radiography 200 (DIR 200)

Module credits	22.00
NQF Level	06
Prerequisites	No prerequisites.
Contact time	1 discussion class per week, 1 seminar per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Skeletal system: Procedures and techniques for: positioning, patient care, selection of Technique factors, radiation protection, pathological conditions and image evaluation. Problem-solving. Execution of radiographic examinations and procedures. Trauma radiography. Alternative imaging 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 image evaluation for neonatal and mobile unit procedures. Orthopaedic theatre procedures. Soft tissue examinations using contrast media in demonstration of Genito-urinary system and gastro-intestinal system.. Introduction to pharmacology and contrast media. Introduction to developing research idea and literature review and research question. Patient assessment, education and care by the diagnostic radiographer. Developing professional attitudes as a diagnostic radiographer practitioner. Patient communication-establishing professional relationship. Patient family interactions. Inter-professional management between divisions in radiography discipline. Inter-professional management within trauma, surgical theatre and hospital wards. Psycho-social management of patient.

Integrated healthcare leadership 210 (IHL 210)

Module credits	8.00
NQF Level	06
Service modules	Faculty of Humanities
Prerequisites	IHL 112/2/3, IHL 120 (For Audiology and Speech-Language Pathology students only IHL 120 is applicable)
Contact time	2 lectures per week
Language of tuition	Module is presented in English
Department	Nursing Science
Period of presentation	Semester 1

Module content

Principles of project management. Communication principles. Leadership. Health promotion and education, advocacy and literacy. Counselling for health behaviour change. NB: Only for School of Healthcare Sciences and Speech- Language Pathology and Audiology students.

Introduction to radiation therapy, nuclear medicine and radiobiology 200 (RNR 200)

Module credits	9.00
NQF Level	06
Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

a. Introduction to radiation therapy: Radiation therapy services organisation. The radiation therapist – Scope of practice; Practice Standards. Cancer management – Cancer incidence; epidemiology and etiological studies; Detection and diagnosis; Prevention. Treatment – Radiation oncology; Surgical oncology; Medical oncology; Immunotherapy; Complementary and alternative medicine. Radiation treatment modalities; Identification and application of radiation therapy equipment and accessories. Key terms related to external beam radiation equipment. Key terms related to radiation dose to be delivered. Radiation beam positioning terms; Patient positioning. Common radiation effects on normal tissue.
b. Introduction to nuclear medicine: Role of Nuclear Medicine in medical diagnosis and treatment. Principles of nuclear physics and nuclear medicine, nuclear instrumentation, radio chemical pharmacology. Basic approach to clinical nuclear medicine and relevant techniques.
c. Introduction to radiobiology: • basic background to the field of radiobiology the interaction of different radiation types with the molecules and organelles of the mammalian cell; biological interaction of different radiation types with the cellular dynamics; biological effect of radiation on organs of the body and the whole body; clinical radiobiology in diagnostic radiography.

Diagnostic radiographic science 200 (RSC 200)

Module credits	15.00
NQF Level	06
Prerequisites	RPH 100, RSC 100
Contact time	1 discussion class per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

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, design and chemicals.
Digital image manipulation: Pre-Processing, Segmentation, Grayscale Processing, Frequency Processing, Reconstruction, Three-Dimensional Representations, Image Fusion/Registration, Computer-Aided Detection (CAD) and Diagnosis
Display technologies: Hard-Copy Printers, Film, Cathode Ray Tube (CRT), Liquid Crystal Display (LCD), Other Displays (e.g., Plasma, Projection)
Viewing Conditions: Viewing Distance, Image and Pixel Size, Workstation Ergonomics, Adaptation and Masking, Ambient Lighting and Illumination. Quality assurance of conventional, computed and digital radiography systems. Hospital integrated computer patient and imaging system and principles of system management in terms of information capture, display, storage and distribution.

Curriculum: Year 3

Minimum credits: 123

Fundamental modules

Anatomical pathology 300 (ANP 300)

Module credits	15.00
NQF Level	07
Prerequisites	ANP 210
Contact time	1 seminar per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Anatomical Pathology
Period of presentation	Semester 1

Module content

Systematic pathology – Capita Selecta:
Respiratory and Circulatory system ; Digestive system; Genito-urinary system; Locomotor system; Nervous system; Female reproductive system; Lymphatic and Haematological systems; Intergumentary system; Endocrine system.
Neoplasia associated with viruses.
Tumour markers.
Developmental tumours and tumour like conditions.
Cysts developing on basis of pre-existing malformations.
Tumours developing in pre-existing malformations.
Definition, Incidence, Epidemiology, Aetiology and Pathogenesis of Male & Female Reproductive system, Breast, Endocrine, Skin, Bones/Joints and Soft tissue, Peripheral nerve, Skeletal muscles, Central Nervous system, Eye, Lung, Head and Neck, Gastro-intestinal tract, Urinary system, Liver and Biliary tract, Pancreas.

Radiographic anatomy 380 (RAN 380)

Module credits	10.00
NQF Level	07
Prerequisites	RFI 210,RFI 211,RAN 280,FSG 251,FSG 252,FSG 262
Contact time	1 discussion class per week, 1 practical per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Anatomy
Period of presentation	Year

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.

Research methodology for healthcare sciences 300 (RHC 300)

Module credits	30.00
NQF Level	07
Service modules	Faculty of Humanities
Prerequisites	IHL 110, IHL 121/2/3/4; (ELH 121 and 122); AIM 111 or 101 (These prerequisites are not applicable to Audiology and Speech-Language Pathology students)
Contact time	2 lectures per week, 2 practicals per week
Language of tuition	Module is presented in English
Department	Nursing Science
Period of presentation	Year

Module content

Concepts of research; research process; research studies appraisal; planning and developing literature review; developing research idea and research question; research principles in designing research proposal; research proposal writing.

Radiation physics 300 (RPH 300)

Module credits	10.00
NQF Level	07
Prerequisites	RPH 200
Contact time	3 lectures per week
Language of tuition	Module is presented in English
Department	Physics
Period of presentation	Semester 1

Module content

Digital radiography: data acquisition (equipment, detectors, analogue to digital conversion), image properties, image matrix, bit depth, file formats, data compression. Image processing (filters, frequency, spatial, Fourier transform), contrast adjustment (histogram equalisation, gamma-, linear and logarithmic adjustment), edge enhancement (pixel shifting, subtraction). Image quality (noise, resolution).

Computed tomography: technological developments in construction and design. Data acquisition (parameters, field size). Image reconstruction (fundamental equations and algorithms). Image processing (CT number, window width, window height). Image quality (resolution, quantum mottle, spatial uniformity, frequency modulation transfer function).
Magnetic resonance imaging: principles (spin angular momentum, torque, precession, magnetic moment, spin orientation, lamor frequency), acquisition (RF pulses, magnetic field gradient, superconductivity, spin echo sequence, weighted images).

Core modules

Clinical practice in diagnostic radiography 300 (CDR 300)

Module credits	15.00
NQF Level	07
Prerequisites	CDR 100& 200, RSC 200, IHL 210
Contact time	4 discussion classes per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Clinical practice to operationalise and integrate the fundamental theoretical components of the third year of studies and to build on the competencies developed in the first and second years of study. Aspects covered in this module include the basic clinical practice and image interpretation of excretory urography, angiography, intervention radiology, mammography, hysterosalpingography, bone densitometry, CT scanning, MRI scanning and myelography. Aspects covered within this module to include radiation protection of patients, public and personnel. Community engagement

Note:
This module comprises 30% of the specified clinical training hours necessary to complete specified clinical competencies for the course in an HPCSA accredited facility.

Diagnostic radiography 300 (DIR 300)

Module credits	20.00
NQF Level	07
Prerequisites	DIR 200, RSC 200, RPH 300
Contact time	1 discussion class per week, 1 lecture per week, 1 seminar per week

Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Venous needle placement.

Cardiovascular system: 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. Pattern recognition.
Mammography: Introduction. Principles of soft tissue radiography. Communication and health promotion. Medico-legal aspects. Management of breast disease, patient care, radiation safety and technique factors. Processing requirements. Positioning principles and special procedures. Systematic evaluation of the images. Pattern recognition.
Hystero-salpingography: 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.
Ultrasonography: General principles in obstetrics and gynaecology, abdomen and pelvis, musculo-skeletal system.
Computer Tomography: Protocols for different examinations. Patient care. Image interpretation. Magnetic resonance imaging: Protocol for the different examinations. Patient care. Myelography.

Integrated healthcare leadership 310 (IHL 310)

Module credits	8.00
NQF Level	07
Service modules	Faculty of Humanities
Prerequisites	IHL 111/2/3, IHL 120, IHL 210, IHL 221/2/3/4 (For Audiology and Speech-Language Pathology students only IHL 210 is applicable)
Contact time	2 lectures per week
Language of tuition	Module is presented in English
Department	Nursing Science
Period of presentation	Semester 1

Module content

Community needs assessment. Leadership in community development. Planning and implementation of collaborative community-based interventions. Application of principles of monitoring and evaluation. NB: Only for School of Healthcare Sciences and Department of Speech - Language Pathology and Audiology students.

Diagnostic radiographic science 300 (RSC 300)

Module credits	15.00
NQF Level	07

Prerequisites	RSC 200; RPH 200
Contact time	1 discussion class per week, 2 lectures per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Informatics: Basic Computer Terminology, Integrating Healthcare Enterprise (IHE), PACS, Radiology Information System (RIS), Hospital Information System (HIS), Electronic Medical Record (EMR), Health Level 7 (HL7) Networks. Film digitisers.

Storage: Hardware, Storage Requirements, Disaster Recovery. DICOM: Modality Worklist, Image and Non-Image Objects, Components and Terminology, DICOM Conformance.

Data Compression: Clinical Impact, Lossy, Lossless, Image and Video Formats.

Security and Privacy: Encryption, Firewalls. Contrast media used in 2-D and 3-D imaging procedures (including MRI), overview of chemical make-up and physical properties of contrast agents, patient risk factors, pre-medication strategies, indicators/symptoms of patient reactions, care and treatment of reactions to contrast agents. Image quality optimisation in CT, Artefacts, factors affecting patient dose. Intervention Radiography (including digital subtraction angiography),
Mammography, Bone densitometry. Application of MRI imaging of musculo-skeletal and central nervous system in terms of image contrast and factors affecting image formation and pulse sequence.
Introduction to Quality assurance and quality control in CT, Intervention Radiography (including Digital subtraction angiography), Mammography, Bone densitometry and MRI. The preparation of patients for contrast media radiographic investigations, technical imaging procedures, and needle placements.

Curriculum: Final year

Minimum credits: 120

Fundamental modules

Multimodality imaging 400 (MMI 400)

Module credits	24.00
NQF Level	08
Prerequisites	RPH 300
Contact time	1 discussion class per week, 1 lecture per week, 1 seminar per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Application of multimodality imaging in Oncological diseases- staging, therapy monitoring and individual risk assessment, and image guided intervention. Neurological diseases. Patient management models in multimodality imaging. Radiographic pathology; Image interpretation of multimodality imaging i.e. CT Scan; MRI; PET/CT; PET/MRI; PET/Mammography; Ultrasonography; Radiation Therapy delivery accuracy verification with Image Guided systems. Technical aspects of management of multimodality imaging systems. Quality assurance in multimodality imaging.

Research in healthcare sciences 400 (RHC 400)

Module credits	10.00
NQF Level	08
Prerequisites	RHC 300
Contact time	1 lecture per week, 1 practical per week
Language of tuition	Module is presented in English
Department	Nursing Science
Period of presentation	Year

Module content

Conducting process of obtaining ethics clearance, data collection, data analysis, research report writing.

Core modules

Clinical practice in diagnostic radiography 400 (CDR 400)

Module credits	35.00
NQF Level	08
Prerequisites	CDR 300

Contact time	4 discussion classes per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Clinical practice to operationalise and integrate the fundamental theoretical components of the fourth-year elective selected and to build on the competencies developed in the first, second and third years of study.

Note:
This module comprises 35% of the specified clinical training hours necessary to complete specified clinical competencies for the course in an HPCSA accredited facility.

Diagnostic radiography 400 (DIR 400)

Module credits	35.00
NQF Level	08
Prerequisites	RPH 300 ; RSC 300; DIR 300
Contact time	1 discussion class per week, 1 lecture per week, 1 seminar per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Phlebotomy. Research, quality assurance, imaging procedures, unit management, clinical practice, digital image acquisition and display, ethics and law, patient care, pharmacology and drug administration and safe practice in one (1) of the following electives (to be offered based on feasibility):

i. CT Scanning
ii. MRI Scanning
iii. Intervention radiography
iv. Community engagement.

Management and leadership 400 (RML 400)

Module credits	16.00
NQF Level	08
Prerequisites	IHL 310
Contact time	1 discussion class per week, 1 lecture per week, 1 seminar per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content
Comprehensive quality management for the radiation Science including diagnostic radiography and relevant modalities e.g., mammography, digital imaging, CT, and MRI. Advanced concepts, current quality management theory, accreditation, and audit documentation are covered. Basic principles and practices necessary for effective supervision and leadership in a health care environment. Inter-disciplinary teamwork principles and practice pertinent to radiography. Principles and practices in human resource management in health care settings. Risk management. Management of change and transformation. Ethical and legal issues influence on practice and the environment. Defining advanced practitioner role; participation within professional bodies; Methods to assess professional outcomes; Customer satisfaction survey components;
Process and procedures for continuous professional development. Novel working practices Reflective practitioner in radiography; Professional role within the community and responsibilities to the community. Establishing own private practice in diagnostic radiography.