

# University of Pretoria Yearbook 2022

## BRad in Diagnostics (10137100)

**Department** Radiography

**Minimum duration of study** 4 years

**Total credits** 504

**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

#### Important information for all prospective students for 2022

- The admission requirements apply to students who apply for admission to the University of Pretoria with a **National Senior Certificate (NSC) and Independent Examination Board (IEB) qualifications.**
- **Applicants with qualifications other than the abovementioned** should refer to:
  - **Brochure:** Undergraduate Programme Information 2022: Qualifications other than the NSC and IEB, available at [click here](#).
- **Citizens from countries other than South Africa (applicants who are not South African citizens)** should also refer to:
  - **Brochure:** Newcomer's Guide 2021, available at [click here](#).
  - **Website:** [click here](#).
- **School of Tomorrow (SOT), Accelerated Christian Education (ACE) and General Education Development Test (GED):** The University of Pretoria no longer accepts qualifications awarded by these institutions.
- **National Certificate (Vocational) (NCV) Level 4:** The University of Pretoria may consider NCV candidates, provided they meet the exemption for bachelor's status criteria and the programme requirements.

#### Transferring students

A transferring student is a student who, at the time of application for a degree programme at the University of



Pretoria (UP) –

- is a registered student at another tertiary institution, **or** was previously registered at another tertiary institution and did not complete the programme enrolled for at that institution, and is not currently enrolled at a tertiary institution, **or** has completed studies at another tertiary institution, but is not currently enrolled at a tertiary institution, **or** has started with tertiary studies at UP, then moved to another tertiary institution and wants to be readmitted at UP.

A transferring student will be considered for admission based on

- an NSC or equivalent qualification with exemption to bachelor's or diploma studies (whichever is applicable); **and** meeting the minimum faculty-specific subject requirements at NSC or tertiary level; **or** having completed a higher certificate at a tertiary institution with faculty-specific subjects/modules passed (equal to or more than 50%), as well as complying with faculty rules on admission;
- previous academic performance (must have passed all modules registered for up to the closing date of application ) or as per faculty regulation/promotion requirements;
- a certificate of good conduct.

**Note:** Students who have been dismissed at the previous institution due to poor academic performance, will not be considered for admission to UP.

### Returning students

A returning student is a student who, at the time of application for a degree programme –

- is a registered student at UP, and wants to transfer to another degree at UP, **or** was previously registered at UP and did not complete the programme enrolled for, and did not enrol at another tertiary institution in the meantime (including students who applied for leave of absence), **or** has completed studies at UP, but is not currently enrolled or was not enrolled at another tertiary institution after graduation.

A returning student will be considered for admission based on

- an NSC or equivalent qualification with exemption to bachelor's or diploma studies (whichever is applicable); **and** meeting the minimum faculty-specific subject requirements at NSC or tertiary level; **or** previous academic performance (should have a cumulative weighted average of at least 50% for the programme enrolled for);
- having applied for and was granted leave of absence.

**Note:** Students who have been excluded/dismissed from a faculty due to poor academic performance may be considered for admission to another programme at UP. The Admissions Committee may consider such students if they were not dismissed more than twice. Only ONE transfer between UP faculties will be allowed, and a maximum of two (2) transfers within a faculty.

### Important faculty-specific information on undergraduate programmes for 2022

- 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).
- All modules will be presented in English, as English is the language of tuition, communication and



correspondence.

- Places are reserved in specific categories to ensure an equitable representation of demographically defined designated groups. Selection thus takes place in different categories.
- For purposes of selection in the Faculty of Health Sciences, the “Designated Group” category includes South African Black African or South African Coloured African candidates. The “Open” category refers to all applicants including applicants from the Designated Group who compete first in the Open category and then in the Designated Group category if unsuccessful in the Open category.
- Target numbers are specified for all categories as applicable to each programme. Where insufficient applications are received from qualifying applicants in a certain category, the selection committee may decide not to fill all places or to fill the places from qualifying applicants in another category.
- A limited number of places are made available to citizens from countries other than South Africa (applicants who are not South African citizens), 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 (applicants who are not South African citizens) 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
- Citizens from countries other than South Africa (applicants who are not South African citizens) who do not comply with the conditions above may be considered if space is available.
- If an applicant has multiple citizenships, which includes South African citizenship, he/she will be considered as a South African applicant.
- The final number of places allocated to new applicants will be determined on an annual basis taking into account the teaching facilities and resources available and, where necessary, the number of places allocated to students repeating modules in the first year of study of each degree programme.
- Only applicants who comply with the requirements set out in this document will be considered for selection. However, the achievement of the minimum requirements does not guarantee admission as only a limited number of students can be accommodated.
- Selection is based on merit. The faculty does not determine specific selection cut-off values for the different categories. Such values are generated by the competing students within a particular category in relation to the number of places available.
- A Merit Point Score (MPS) is used for ranking applicants for selection purposes in all programmes. In certain programmes other criteria such as rural residence may be used as part of the selection process.
- Only first-choice applicants will be considered, except where otherwise specified, in which case second-choice candidates may be considered if there are places available.
- The top candidates will be selected provisionally up to or surpassing the allocated number, based on experience of the expected number of acceptances. A waiting list is created from the group of candidates with the next highest scores. The length of the waiting list is determined by experience of the number of places likely to become available and to prevent creating unrealistic expectations.
- All offers are provisional until the final exam results have been received. For applicants in the School leaver categories a provisional place will be confirmed as long as the NSC or equivalent scores do not fall by more than two points from the Grade 11 APS score.
- After the final NSC or equivalent qualification results are received, provisional offers will be confirmed if the applicant still meets the required criteria. The MPS of those on the waiting list will be recalculated using the NSC or equivalent qualification results and if places become available they will be made offers.
- Places becoming available in any category after selection due to cancellation or forfeiture will be filled from the waiting list for the specific category.



- This waiting list will remain active until the end of the second week after the start of lectures.
- All successful candidates are admitted to the first year of study only. Registered students in the University Experienced categories may apply for credit for equivalent modules which they have completed.
- Incomplete applications will not be considered and any false information provided by an applicant in his/her application may result in immediate cancellation of the application, admission or registration.
- **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.

University of Pretoria website [click here](#)

### Minimum requirements

#### Achievement level

#### English Home

#### Language or

#### English First

#### Additional

#### Language

NSC/IEB

4

#### Mathematics

NSC/IEB

4

#### Physical Sciences

NSC/IEB

4

#### APS

**30**

## Additional requirements

### **Please note:**

Each student in BRad in Diagnostics must apply to the Registrar of the Health Professions Council of South Africa for registration as a student in BRad in Diagnostics immediately after admission to the first year of study.

## 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.

### **Examinations**

- There are two main examination periods per annum. In respect of first-semester modules, the standard examination is in May/June and the supplementary examination is in October/ November and the supplementary examination in November/December of the same year. Where students need to work additional clinical hours to be allowed to do a supplementary examination, the relevant head of department will determine the date of the supplementary examination.



- Only two examination opportunities per module are allowed. If a student fails the supplementary examination, the module must be repeated.
- A supplementary examination in a module is granted to students in the following cases:
  - If a student obtains a final mark of between 40%-49% in the relevant module at the standard examination and thus fails.
  - If a student obtains a final mark of at least 50% but the required subminimum in the examination, as required for a specific module, has not been obtained.
- Students intending to sit the supplementary examination due to the reasons mentioned above, must register for the supplementary examination opportunity 24 hours after the results have been made public.
- If a student fails a module at the standard examination opportunity, the examination mark obtained in the relevant module at the supplementary examination 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 supplementary examination a maximum of 50% is awarded as a pass mark to the module in question.
- A student who is prevented from writing the standard examination due to illness or other qualifying circumstances, may be granted permission by the dean to write a special examination in the particular module(s). If a student is granted permission by the dean to write a special examination, the continuous evaluation mark, together with the examination mark obtained in the module in question at the special examination, will be calculated as the final mark obtained in the module.
- In instances where students are unable to write the examination and supplementary examination as a consequence of a serious medical condition or an accident, such a student must apply for a special dispensation, with the support of the dean, to the Registrar, who will make a final decision.

### **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

### **Chancellor's examination: Fourth year of study**

A Chancellor's examination for a student who failed the module; Clinical Practice in Diagnostic Radiography IV. He or she must undergo further clinical instruction in specified 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.

### **Exemption from the examination in (ANP) Anatomical Pathology 210**

Exemption from the examination may be granted if a student who obtained a module mark of at least 65%, exercises the option to accept it as the final mark.

### **Passing modules in Anatomy and Physiology**

- i. A **module mark** is calculated from the continuous evaluation opportunities during the course of the presentation of the relevant module. These evaluations will include one or more of the following:



- a. Evaluations in connection with theoretical knowledge.
  - b. Evaluations in connection with practical knowledge and skills.
  - c. Compulsory attendance at and active participation in prescribed activities.
  - d. A final comprehensive module test.
- ii. Students may exercise the option that the module mark at the end of the semester be ratified as the final module mark for the relevant module (i.e. they are exempted from the module examination for this module), if they comply with the following requirements:
- a. The abovementioned module mark is more than 65%.
  - b. Proven attendance of all applicable module-specific activities, namely:
    - All tests/continuous evaluations.
    - All practical work and skills development sessions.
    - c. Attendance of the relevant module from Day 1.
    - d. No convictions by the School's Preliminary Disciplinary Committee (Student Transgressions) of any form of transgression.
  - iii. A **module examination** is granted to all registered students (even if the module mark is more than 65%).
  - iv. The **final module mark** is calculated from the examination mark and the module mark (continuous evaluation) in the ratio 50:50.
  - v. A **second module examination** is granted to all students who have obtained a final module mark of 40% to 49%. Students who have obtained a module mark of less than 40%, fail the module and will have to repeat the year of study.
  - vi. The relevant **second examination** will take place in November/December of the current year or in January of the subsequent year. A minimum of 50% is required to pass in the second examination.
  - vii. **Aegrotats or extraordinary examinations**, for students who could not sit the module examination due to health or other acceptable reasons, will take place during the second examination period. Students must apply formally for these examinations, and will be admitted by the Chairperson of the School or his/her authorised person. Where applicable, the Chairperson of the School may first require the recommendation of the Faculty Health Committee before admission to an aegrotat.

**All** modalities of a final examination must be written jointly as a special examination, even if part of the relevant examination had already been written during the previous examination period.

The **final module mark** is calculated from the marks of all the sections/ modalities of the special examination and the continuous evaluation mark. The same criteria as set for a pass mark in a module are applicable here. Students who could not sit the module examination in the examination period due to acceptable reasons, and who are consequently writing the module examination in the supplementary examination period, forfeit the opportunity to be admitted to a further examination.

## Pass with distinction

The degree is conferred with distinction on a student who has obtained an average of at least 75% (not rounded) in the final-year modules.



## Curriculum: Year 1

**Minimum credits: 132**

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, BOT, BRad and BPhysT) 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 Sciences 122 (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



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

#### Module content

Introduction to physiological principles; neurophysiology, and muscle physiology.

### Physiology 162 (FSG 162)

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

#### Module content

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

### Medical terminology 180 (MTL 180)

<b>Module credits</b>	12.00
<b>NQF Level</b>	05
<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>	Module is presented in English
<b>Department</b>	Ancient and Modern Languages and Cultures
<b>Period of presentation</b>	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)

<b>Module credits</b>	20.00
<b>NQF Level</b>	05
<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>Department</b>	Anatomy
<b>Period of presentation</b>	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)

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

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

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

### isiZulu for beginners 119 (ZUL 119)

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

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

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

## 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



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**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 neuropathology.

#### 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 and/or 2

#### 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)



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

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

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

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

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

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



## Module content

- 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.
- 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.
- 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)

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

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

<b>Module credits</b>	30.00
<b>NQF Level</b>	07
<b>Service modules</b>	Faculty of Humanities
<b>Prerequisites</b>	IHL 110, IHL 121/2/3/4; (ELH 121 and 122); AIM 111, prerequisites for BA Audiology: ODL 210 and 220; KMP 210 and 220, prerequisites for BA Speech-Language Pathology students: SPP 210 and 220; KMP 210 and KMP 220.
<b>Contact time</b>	2 lectures per week, 2 practicals per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Nursing Science
<b>Period of presentation</b>	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)

<b>Module credits</b>	10.00
<b>NQF Level</b>	07
<b>Prerequisites</b>	RPH 200
<b>Contact time</b>	3 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Physics
<b>Period of presentation</b>	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, Larmor frequency), acquisition (RF pulses, magnetic field gradient, superconductivity, spin echo sequence, weighted images).

## Core modules

### Clinical practice in diagnostic radiography 300 (CDR 300)

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

<b>Module credits</b>	20.00
<b>NQF Level</b>	07
<b>Prerequisites</b>	DIR 200, RSC 200, RPH 300
<b>Contact time</b>	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



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

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

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

<b>Module credits</b>	35.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	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



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## 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.

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