University of Pretoria Yearbook 2017

BRad Diagnostics (10137005)

Duration of study	3 years
Total credits	420
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Programme information

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

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

Admission requirements

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

Minimum requirements

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

Examinations and pass requirements

Subminimum

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

- In accordance with the stipulations of the General Regulations, no minimum year or semester mark is needed for admission to the examination, and all registered students are admitted to the examination automatically.
- The final mark for a specific module in Nursing Science, Physiotherapy, Radiography, Occupational Therapy and Human Nutrition (at least 50% is required to pass) is calculated from the examination mark as well as the mark compiled from the evaluation of a student during continuous, objective and controlled assessment opportunities during the course of the quarter/semester/year. At least one formal assessment per module is set as the minimum norm, and students will be exposed on a continuous and regular basis to self-directed assignments in order to promote reflective learning.
- In the case of modules with practical components, students are required to also comply with the applicable attendance requirements with regard to acquiring practical skills before a pass mark can be obtained for the module.
- There are two main examination opportunities per annum, the first and second examination. In respect of first-semester modules, the first examination opportunity is in May/June and the second examination opportunity in July. In respect of second-semester modules, the first examination opportunity is in October/ November and the second examination opportunity in November/December of the same year. Where students need to work additional clinical hours to be allowed to do a second examination, the Head of Department will determine the second examination opportunity.
- Only two examination opportunities per module are allowed. If a student fails a module at the second examination opportunity, the module must be repeated.
- A second examination opportunity in a module is granted to students in the following cases:

  - If a student obtains a final mark of less than 50% in the relevant module at the first examination opportunity and thus fails.

  - If a student does not obtain the subminimum in the examination, as required for a specific module.

  - If a student does not sit the examination in a module at the first examination opportunity due to illness or extraordinary circumstances.
- Students intending to sit the second examination due to the reasons mentioned above, must register for the second examination opportunity 24 hours after the results have been made public.
- If a student fails a module at the first examination opportunity, the examination mark obtained in the relevant module at the second examination opportunity will be calculated as the final mark. The marks obtained with continuous evaluation during the course of the quarter/semester/year will not be taken into calculation. If the

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

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

Promotion to next study year

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

The following fundamental modules are relevant:

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

Pass with distinction

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

Curriculum: Year 1

Minimum credits: 163

Choose between Sepedi and Zulu.

Fundamental modules

Physiology 161 (FSG 161)

Module credits	12.00
Prerequisites	No prerequisites.
Contact time	4 lectures per week, 1 practical per week
Language of tuition	Afrikaans and English is used in one class
Academic organisation	Physiology
Period of presentation	Quarter 3

Module content

Introduction to physiological principles; neurophysiology, and muscle physiology.

Physiology 162 (FSG 162)

Module credits	12.00
Prerequisites	No prerequisites.
Contact time	4 lectures per week, 1 practical per week
Language of tuition	Afrikaans and English is used in one class
Academic organisation	Physiology
Period of presentation	Quarter 4

Module content

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

Medical terminology 180 (MTL 180)

Module credits	12.00
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	Afrikaans and English is used in one class
Academic organisation	Ancient Languages and Cultures
Period of presentation	Semester 1 and Semester 2

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
Prerequisites	No prerequisites.
Contact time	1 practical per week, 2 lectures per week
Language of tuition	Module is presented in English
Academic organisation	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 110 (RFI 110)

Module credits	10.00
Service modules	Faculty of Health Sciences
Prerequisites	No prerequisites.
Contact time	2 lectures per week
Language of tuition	Separate classes for Afrikaans and English
Academic organisation	Physics
Period of presentation	Year

Module content

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

Sepedi for beginners 110 (SEP 110)

Module credits	12.00

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

Module content

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

isiZulu for beginners 110 (ZUL 110)

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

Module content

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

Academic information management 101 (AIM 101)

Module credits	6.00

Service modules	Faculty of Engineering, Built Environment and Information Technology Faculty of Education Faculty of Economic and Management Sciences Faculty of Humanities Faculty of Law Faculty of Health Sciences Faculty of Natural and Agricultural Sciences Faculty of Theology Faculty of Veterinary Science
Prerequisites	No prerequisites.
Contact time	2 lectures per week
Language of tuition	Separate classes for Afrikaans and English
Academic organisation	Information Science
Period of presentation	Semester 1

Module content

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

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

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

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
Service modules	Faculty of Health Sciences
Prerequisites	No prerequisites.
Contact time	2 lectures per week, 1 discussion class per week
Language of tuition	Module is presented in English

Academic organisation	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)*

Academic orientation 110 (UPO 110)

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

Core modules

Radiographic imaging 186 (RAW 186)

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

Module content

Introduction: Discovery of X-rays, processing principles, handling of X-ray equipment. X-beam: production of X-rays, attenuation.
Properties of the radiographic image: visibility and geometric properties.
Image formation: interaction between X-rays and the human body and subject contrast.
Primary exposure factors: mAs, kVp and SID. AEC. Principles of technique charts. Image recording: darkrooms, cassettes, intensifying screens, efficiency of rare earth intensifying screens and X-ray film construction.
Control of scatter radiation: production of scatter, effect of scattered radiation on the image, beam restriction devices, grids and grid efficiency.
Geometry: focal spot size, SID, OID, X-ray beam/body part/film alignment, influence of distances and other variables on the geometric properties of the image. Introduction to digital radiography.

Radiography 185 (RAW 185)

Module credits	48.00
Contact time	1 lecture per week, 1 seminar per week, 4 discussion classes per week
Language of tuition	Module is presented in English
Academic organisation	Radiography
Period of presentation	Year

Module content

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

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

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

Curriculum: Year 2

Minimum credits: 133

Fundamental modules

Physiology 251 (FSG 251)

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

Module content

Structure, gas exchange and secretory functions of the lungs; build, excretory and non-urinary functions of the kidneys, acid-base balance, as well as the skin and body temperature control.
Practical work: lung functions/spirometry, kidney function tests – side-room urine examinations. Digestion. Metabolism. Pathophysiology.

Physiology 252 (FSG 252)

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

Module content

Nutrition, digestion and metabolism, hormonal control of body functions and the reproductive systems.
Practical work: endocrine system, reproductive system, pregnancy test.

Physiology 262 (FSG 262)

Module credits	6.00
Prerequisites	RAN 100, RFI 110, FSG 161, FSG 162, RAW 180, RAW 182, MTL 180
Contact time	3 lectures per week
Language of tuition	Afrikaans and English is used in one class
Academic organisation	Physiology
Period of presentation	Quarter 4

Module content
Applied pathophysiology.

Basic emergency care 286 (GNK 286)

Module credits	5.00
Prerequisites	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	8 practicals per week, 1 other contact session per week
Language of tuition	Separate classes for Afrikaans and English
Academic organisation	Health Sciences Dean's Office
Period of presentation	Semester 1 and/or 2

Module content

Theory and practical training in basic emergency care.

Radiographic anatomy 280 (RAN 280)

Module credits	10.00
Prerequisites	RFI 110,MTL 180,RAN 100,FSG 161,FSG 162,RAW 182,RAW 180
Contact time	1 other contact session per week, 1 discussion class per week, 2 lectures per week
Language of tuition	Module is presented in English
Academic organisation	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 210 (RFI 210)

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

Module content

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

Radiation physics 211 (RFI 211)

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

Module content

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

Core modules

Radiography 280 (RAW 280)

Module credits	54.00
Prerequisites	RAN 100,RFI 110,FSG 161,FSG 162,RAW 180,RAW 182,MTL 180
Contact time	1 lecture per week, Community Engagement, 3 discussion classes per week
Language of tuition	Afrikaans and English is used in one class
Academic organisation	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 film evaluation. Problem-solving. Execution of radiographic examinations and procedures. Trauma. Alternative imaging and film principles and procedures. Apparatus. Radiation protection.
Radiographic procedures: Execution of radiographic examinations and procedures, selection of technique factors, radiation protection, problem-solving, pathological conditions and film evaluation for neonatal and mobile unit procedures. Orthopaedic theatre procedures. Soft tissue contrast media examinations. Applied nursing sciences. Research principles
Practical implementation: Compilation of a portfolio. Theoretical and practical tuition are used to integrate science and clinical radiography.

Radiographic imaging 282 (RAW 282)

Module credits	20.00
Prerequisites	RAN 100,RFI 110,FSG 161,FSG 162,RAW 180,RAW 182,MTL 180
Contact time	1 discussion class per week, 1 lecture per week
Language of tuition	Afrikaans and English is used in one class
Academic organisation	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 and design, chemicals. Quality assurance tests. Digital radiography: image formation and processing.

Radiation therapy and nuclear medicine 284 (RAW 284)

Module credits	10.00
Prerequisites	RAN 100,RFI 110,FSG 161,FSG 162,RAW 180,RAW 182,MTL 180
Contact time	1 discussion class per week, 1 lecture per week
Language of tuition	Afrikaans and English is used in one class
Academic organisation	Radiography
Period of presentation	Quarter 4

Module content

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

Radiographic imaging 286 (RAW 286)

Module credits	19.00
Prerequisites	RAN 100, RFI 110, FSG 161, FSG 162, RAW 185, RAW 186, MTL 180
Contact time	1 lecture per week, 1 discussion class per week
Language of tuition	Afrikaans and English is used in one class
Academic organisation	Radiography
Period of presentation	Year

Module content

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

Radiography 285 (RAW 285)

Module credits	52.00
Prerequisites	RAN 100, RFI 110, FSG 161, FSG 162, RAW 185, RAW 186, MTL 180
Contact time	Community Engagement, 3 discussion classes per week, 1 lecture per week
Language of tuition	Afrikaans and English is used in one class
Academic organisation	Radiography
Period of presentation	Year

Module content

Skeletal system: Procedures and techniques for: positioning, patient care, selection of technique factors, radiation protection, pathological conditions and film evaluation. Problem-solving. Execution of radiographic examinations and procedures. Trauma. Alternative imaging and film principles and procedures. Apparatus. Radiation protection.
Radiographic procedures: Execution of radiographic examinations and procedures, selection of technique factors, radiation protection, problem-solving, pathological conditions and film evaluation for neonatal and mobile unit procedures. Orthopaedic theatre procedures. Soft tissue contrast media examinations. Applied nursing sciences. Research principles
Practical implementation: Compilation of a portfolio. Theoretical and practical tuition are used to integrate science and clinical radiography.

Radiation therapy and nuclear medicine 287 (RAW 287)

Module credits	9.00
Prerequisites	RAN 100, RFI 110, FSG 161, FSG 162, RAW 185, RAW 186, MTL 180
Contact time	1 lecture per week, 1 discussion class per week
Language of tuition	Afrikaans and English is used in one class

Academic organisation	Radiography
Period of presentation	Quarter 4

Module content

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

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

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

Curriculum: Final year

Minimum credits: 124

Fundamental modules

Anatomical pathology 210 (ANP 210)

Module credits	10.00
Prerequisites	[PHY 131, CMY 151, FSG 161, FSG 162, FTP 100, ANA 152, ANA 162] or [FSG 251,FSG 252, FSG 261, FSG 262, AKU 200, ART 282, ART 284, RPD 200, ART 281, ART 283] or [RAN 280, RAW 281, RAW 282, RAW 283]
Contact time	1 seminar per week, 2 lectures per week
Language of tuition	Separate classes for Afrikaans and English
Academic organisation	Anatomical Pathology
Period of presentation	Semester 1

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.

Radiographic anatomy 380 (RAN 380)

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

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.

Radiation physics 310 (RFI 310)

Module credits	10.00
Service modules	Faculty of Health Sciences
Prerequisites	FSG 251, RFI 210, RAW 281, RBG 281, RAN 280, RAW 282, FSG 252, FSG 262, RAW 284 and RFI 211

Contact time	3 lectures per week
Language of tuition	Module is presented in Afrikaans
Academic organisation	Physics
Period of presentation	Semester 1

Module content

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

Research in healthcare sciences 480 (RHC 480)

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

Module content

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

Core modules

Radiography 380 (RAW 380)

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

Academic organisation	Radiography
Period of presentation	Year

Module content

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

Radiography practice 382 (RAW 382)

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

Module content

Ethics. Law as applied to radiography. Health care. Healthcare delivery. Systems. Health policy (national and international).
Planning of health facilities and services.
General management principles as applied to a radiography department. Purchase specifications processors and basic x-ray equipment. Comparison for clinical use. Accepting criteria.
Radiation safety: Simplifying and standardizing technique. Radiation protection and control (personnel and patients).
Quality assurance: Introduction. Quality patient care and assessment. Reject film analysis and research report.
Quality control tests and corrective action.
Film evaluation.

Radiography 383 (RAW 383)

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

Module content

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

Radiography practice 384 (RAW 384)

Module credits	28.00
Contact time	1 seminar per week, 2 discussion classes per week, 1 lecture per week
Language of tuition	Afrikaans and English is used in one class
Academic organisation	Radiography
Period of presentation	Year

Module content

Ethics. Law as applied to radiography. Health care. Healthcare delivery. Systems. Health policy (national and international).
Planning of health facilities and services.
General management principles as applied to a radiography department. Purchase specifications processors and basic x-ray equipment. Comparison for clinical use. Accepting criteria.
Radiation safety: Simplifying and standardizing technique. Radiation protection and control (personnel and patients).
Quality assurance: Introduction. Quality patient care and assessment. Reject film analysis and research report.
Quality control tests and corrective action.
Film evaluation.

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