

University of Pretoria Yearbook 2022

BRadHons *Nuclear Medicine* (10247013)

Department Radiography

Minimum duration of study 1 year

Total credits 120

NQF level 08

Programme information

Students who did not register at undergraduate level (i.e. from the second year of study) in Nuclear Medicine, register according to this curriculum.

All students must register for NVB 700 Research principles.

Also consult the General Academic Regulations G16-G29.

Admission requirements

1. BRad (or equivalent) degree with a weighted average of at least 60% in the final year **or** Bachelor in Technology: Radiography with a weighted average of at least 60% in the final year **or** National Diploma in Radiography and BRadHons bridging programme with a weighted average of at least 60%. Maximum of two attempts for the bridging examination
2. Applicants with BRad (or equivalent) or Bachelor in Technology: Radiography with a weighted average of less than 60% in the final year, must do the bridging programme and pass with a weighted average of at least 60%. A maximum of two attempts will be permitted in order to pass the bridging examination with the required weighted average of 60% and thereby gain admission to the relevant plan.
3. Research methodology passed at bachelor's level
4. Registration as a radiographer or a postgraduate student with the Health Professions Council of South Africa (HPCSA)
5. Access to accredited, suitable training facilities

Examinations and pass requirements

- i. In accordance with the stipulations of the General Academic Regulations a year mark of at least 40% is required for admission to the standard examination in all postgraduate modules in the University where year marks apply.
- ii. Each paper written for the standard examination must be passed individually with 50%.
- iii. There is one examination period for the standard examination in October/ November and the supplementary examination in November/December of the same year.
- iv. If a student fails the supplementary examination, the module must be repeated.

- v. A supplementary examination in a module is granted to a student, if a student obtains a final mark of between 40%-49% in any module at the examination.
- vi. Students intending to sit for 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.
- vii. If a student fails a module in the standard examination, 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 quarter/semester/year will not be taken into calculation. If the student passes the module in the supplementary examination, a maximum of 50% is awarded as a pass mark to the module in question.
- viii. 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).
- ix. 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.
- x. 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.
- xi. A student who has failed one module but who has passed all other modules, may be admitted to a Chancellor's examination in the module in question at the end of the first semester of the subsequent year, after obtaining a subminimum of 40% in the first semester.
- xii. A final year student who has failed more than one module, must register for the whole year to complete the modules in question.

Pass with distinction

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



Curriculum: Final year

Minimum credits: 120

Fundamental modules

Research principles 700 (NVB 700)

Module credits	5.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	1 discussion class per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Semester 1

Module content

Development and submission of a research protocol.

Core modules

Nuclear medicine 701 (KDE 701)

Module credits	25.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	1 discussion class per week, 2 seminars per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Module consists of two sections to integrate with theoretical knowledge gained in TKG 710 (Theory of nuclear medicine). Clinical practice to operationalise and integrate the fundamental theoretical components. Choice of examination, patient positioning, field of view, orientation, routine views, static and dynamic imaging, SPECT imaging, modified views, acquisition and processing of data, correct labelling of data, patient care. Quality control. Pattern recognition and interpretation of procedures. Problems and pitfalls. Hot laboratory rules, regulations, skills, calculations. Cold laboratory equipment and procedures. Application of radiation safety. Advanced imaging and processing techniques. Procedures involving the use of emerging technologies and radiopharmaceuticals. Paediatric nuclear medicine diagnostic imaging. Management and administration of therapeutic radiopharmaceuticals. Radiation safety aspects. Comprehensive quality assurance and unit management. Establishing nuclear medicine services. Advanced concepts, current quality management theory, accreditation, and audit documentation. Basic principles and practices necessary for effective supervision and leadership in a healthcare environment. Principles and practices in human resource management in healthcare settings.

Radiochemistry and pharmacology 700 (RCF 700)

Module credits	20.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	1 lecture per week, 1 practical per week
Language of tuition	Module is presented in English
Department	Radiography
Period of presentation	Year

Module content

Definitions, principles, concepts, terminology, notation. Production and purification of radionuclides. Generators: working knowledge, evaluation techniques, quality control. Technegas production. Radiolabelling methods. Characteristics and quality control of radiopharmaceuticals. Biodistribution, pharmacokinetics, metabolism of radiopharmaceuticals. Kit preparation. Diagnostic and therapeutic radiopharmaceuticals, requirements, radiobiological aspects and applications. Hot laboratory: Rules and regulations. Type A, B, C laboratories. Radiopharmacy construction and design. Radiation safety and protection. Relevant instrumentation and equipment hot and cold lab. Handling, storage and waste disposal of radioactive materials. Contamination and decontamination procedures. Radiopharmaceuticals: preparation, dose calculation and measurement. Molecular imaging. Adverse reactions and altered biodistribution.

Research report: Radiography 700 (RSK 700)

Module credits	30.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	as scheduled with study leader
Language of tuition	Module is presented in English

Department Radiography

Period of presentation Year

Module content

Continuation of the research process which includes the implementation of the approved research protocol and writing up a research essay of the completed research project.

Radiation physics and instrumentation for nuclear medicine 700 (SFI 700)

Module credits 15.00

NQF Level 08

Prerequisites No prerequisites.

Contact time 2 lectures per week

Language of tuition Module is presented in English

Department Radiography

Period of presentation Year

Module content

Basic concepts of radiation physics, radioactive decay, radionuclide production, interaction with matter, radiation detectors and counting systems. Problems in radiation detection. The gamma camera: performance, image quality, quality control. Digital computers in nuclear medicine. SPECT principles, cameras, quality. PET principles, cameras, quality. Radiation dosimetry and biology. Radiation protection and safety.

Theory of nuclear medicine 710 (TKG 710)

Module credits 25.00

NQF Level 08

Prerequisites No prerequisites.

Contact time 1 lecture per week

Language of tuition Module is presented in English

Department Radiography

Period of presentation Year

Module content

Revision of relevant anatomy, physiology and pathology. Procedures of musculoskeletal, endocrine, respiratory, genito-urinary, gastro-intestinal, hepatobiliary, cardiovascular, central nervous systems. Infection and SPECT imaging. Procedures including lymphatics, venograms, ciliary clearance, dacryoscintigraphy. Non-imaging procedures. Radio-immunoassays: History, basic principles, antibody production. Monoclonal antibodies. Radioimmunoscintigraphy. Radiation safety. Tumour imaging and therapeutic procedures. Paediatric techniques. PET and PET/CT. Indications and contra-indications. Effects of medication on procedures. Drug intervention. Radiopharmaceuticals: methods of administration, choice, physiological pathways, patient dose, quality control. Instrumentation, collimation, settings, quality control. Patient treatment: patient preparation, instructions, route and technique of radiopharmaceutical administration. Procedures: choice of examination, patient positioning, field of view, orientation, routine views, static and dynamic imaging, SPECT imaging, modified views. Radiation effects: physical, biological and effective $T_{1/2}$, target organs, excretory pathways, protection. Quality control. Pattern recognition and interpretation of procedures. Problems and pitfalls. Emerging and hybrid technology and applications.

The regulations and rules for the degrees published here are subject to change and may be amended after the publication of this information.

The [General Academic Regulations \(G Regulations\)](#) and [General Student Rules](#) apply to all faculties and registered students of the University, as well as all prospective students who have accepted an offer of a place at the University of Pretoria. On registering for a programme, the student bears the responsibility of ensuring that they familiarise themselves with the General Academic Regulations applicable to their registration, as well as the relevant faculty-specific and programme-specific regulations and information as stipulated in the relevant yearbook. Ignorance concerning these regulations will not be accepted as an excuse for any transgression, or basis for an exception to any of the aforementioned regulations.