

University of Pretoria Yearbook 2020

BRadHons Nuclear Medicine (10247013)

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 Regulations.

Admission requirements

- The BRad degree, the Bachelor in Technology: Radiography or an equivalent qualification in the relevant field of specialisation.
- The candidate must have access to equipment and patients in a healthcare facility approved by the Department, for the purpose of undertaking work-integrated learning associated with the programme in which the student will be registered.
- The candidate must be registered as radiographer with the Health Professions Councils of South Africa (HPCSA) (for candidates who are South African Citizens).
- International students will be registered with the HPCSA as postgraduate students.
- Admission is subject to the approval of the head of department: with the proviso that a candidate must have obtained an average of more than 60% in the modules of his or her final year of the bachelor's degree study.
- Candidates who do not meet this requirement will be expected to pass the BRadHons bridging programme as stipulated by the Department.
- Successful completion of a research methodology module with a minimum credit weighting of 16 credits in the prerequisite degree.

Examinations and pass requirements

Second examinations may be granted in modules not passed, according to the stipulations of the School of Healthcare Sciences in this regard.

Pass with distinction

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

Curriculum: Final year

Minimum credits: 120

Fundamental modules

Research principles 700 (NVB 700)

Module credits 5.00

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

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)

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| Module credits | 20.00 |
| 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)

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|-------------------------------|--------------------------------|
| Module credits | 30.00 |
| 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)

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| Module credits | 15.00 |
| 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)

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|-------------------------------|--------------------------------|
| Module credits | 25.00 |
| 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 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.