



# University of Pretoria Yearbook 2023

## BScHons (Medical Physics) (10243003)

**Department** Radiation Oncology

**Minimum duration of study** 1 year

**Total credits** 170

**NQF level** 08

### Programme information

The following requirements are set for completing the programme:

- Advanced instruction by means of self-tuition and four compulsory seminars of which at least one must be read to and defended before the department in question, on topics assigned to the student.
- Practical experience of the laboratory techniques used in the particular subsections of the subject.
- Attendance at the compulsory faculty module (TNM 700) Applied research methodology 700.
- Successful completion of the prescribed module (MBS 700) Medical biostatistics 700.
- Taking part in a research project and presentation of an independent research report.
- Satisfactory attendance at a library-user course.

### Admission requirements

1. Relevant bachelor's (or equivalent) degree with at least one applicable biological subject as a major
2. A weighted average of at least 60% at final-year level

### Additional requirements

The prerequisites for admission to the honours degree in certain fields of study are indicated in the syllabuses of the specific department.

Also consult General Academic Regulations G16-G29.

### Other programme-specific information

Modules to be taken in the Department of Physics, Faculty of Natural and Agricultural Sciences:

- FSK 710 Mathematical methods 710
- FSK 711 Classical dynamics 711
- FSK 713 Quantum mechanics 713
- FSK 714 Electrodynamics 714

Modules to be taken in the School of Medicine:

- GNF 700 Medical physics: Practical work 700



- GNF 701 Medical physics: Nuclear medicine 701
- GNF 702 Medical physics: Diagnostic radiology 702
- GNF 703 Medical physics: Radiation physics 703
- GNF 704 Medical physics: Radiotherapy 704
- GNF 705 Medical physics: Radiation protection 705

## Examinations and pass requirements

- i. The examination at the end of the programme will consist of two written papers of three hours each as well as an oral examination of 30 minutes.
- ii. For the field of specialisation Medical Physics, one examination of three hours is required in each of the theoretical modules. The mark awarded to the practical work will also be taken into account when the final mark is calculated.
- iii. To comply with the pass requirements for the degree, a student must obtain a final mark of at least 50% in each division as indicated, as well as a pass mark of at least 50% for the essay/work assignment (if applicable). The stipulations regarding pass requirements for dissertations in the General Academic Regulations apply mutatis mutandis to essays.
- iv. Also consult General Academic Regulation G18 regarding Renewal of registration.

## 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 examination (written, oral, practical, etc).

## General information

### **University of Pretoria Programme Qualification Mix (PQM) verification project**

*The higher education sector has undergone an extensive alignment to the Higher Education Qualification Sub-Framework (HEQF) across all institutions in South Africa. In order to comply with the HEQSF, all institutions are legally required to participate in a national initiative led by regulatory bodies such as the Department of Higher Education and Training (DHET), the Council on Higher Education (CHE), and the South African Qualifications Authority (SAQA). The University of Pretoria is presently engaged in an ongoing effort to align its qualifications and programmes with the HEQSF criteria. Current and prospective students should take note that changes to UP qualification and programme names, may occur as a result of the HEQSF initiative. Students are advised to contact their faculties if they have any questions.*



## Curriculum: Final year

Minimum credits: 170

### Core modules

#### Mathematical methods 710 (FSK 710)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	6 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

Series; complex analysis; Bessel and other special functions; integral transforms; Green functions

#### Classical dynamics 711 (FSK 711)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	6 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

Advanced problems in classical dynamics; Hamilton formalism; canonical transformations; continuum mechanics

#### Quantum mechanics (I) 713 (FSK 713)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	4 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

Measurement process, General indefinite relations, Harmonic oscillator, symmetry, invariants and conservation laws, angular momentum, spin, perturbation theory, Schrödinger-Heisenberg and interaction pictures

### Electrodynamics (I) 714 (FSK 714)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	4 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

Poisson equation, Green functions, Maxwell equations.

### Medical physics: Practical work 700 (GNF 700)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	1 practical per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Radiation Oncology
<b>Period of presentation</b>	Year

### Medical physics: Nuclear medicine 701 (GNF 701)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<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>	Radiation Oncology
<b>Period of presentation</b>	Year

### Medical physics: Diagnostic radiology 702 (GNF 702)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08



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<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>	Radiation Oncology
<b>Period of presentation</b>	Year

### Medical physics: Radiation physics 703 (GNF 703)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<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>	Radiation Oncology
<b>Period of presentation</b>	Year

### Medical physics: Radiotherapy 704 (GNF 704)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<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>	Radiation Oncology
<b>Period of presentation</b>	Year

### Medical physics: Radiation protection 705 (GNF 705)

<b>Module credits</b>	15.00
<b>NQF Level</b>	08
<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>	Radiation Oncology
<b>Period of presentation</b>	Year

### Medical biostatistics 700 (MBS 700)

<b>Module credits</b>	20.00
<b>NQF Level</b>	08



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<b>Contact time</b>	1 lecture per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Statistics
<b>Period of presentation</b>	Semester 1

#### **Module content**

The role of statistics and the data analysis process, collecting data sensibly, graphical methods for describing data, numerical methods for describing data, summarizing bivariate data, probability, random variables and probability distributions, sampling variability and sampling distributions, estimation using a single sample, hypothesis testing using a single sample, comparing two populations or treatments, the analysis of categorical data and goodness-of-fit tests, simple linear regression and correlation: inferential methods, multiple regression analysis, analysis of variance, nonparametric (distribution-free) statistical methods. This course is designed as a statistics building block for a non-statistics major postgraduate student at master's level.

### **Applied research methodology 700 (TNM 700)**

<b>Module credits</b>	0.00
<b>NQF Level</b>	08
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	School of Medicine
<b>Period of presentation</b>	Semester 1

#### **Module content**

\*Attendance module only.

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#### **Regulations and rules**

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.

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