

# University of Pretoria Yearbook 2025

## BSc specialising in Mathematics 4-year programme (02131003)

**Department** Mathematics and Applied Mathematics

**Minimum duration of study** 4 years

**Total credits** 502

**NQF level** 07

### Programme information

This is an extended BSc degree programme with a four-year curriculum that is only presented on a full-time basis. It is designed to enable students, who show academic potential, to obtain a BSc degree.

This programme is directed at a general formative education in the natural sciences. It provides the student with a broad academic basis to continue with postgraduate studies and prepares the student for active involvement in a wide variety of career possibilities.

1. Students who are admitted to one of the BSc four-year programmes register for one specific programme.
2. These programmes are followed by students who, as a result of exceptional circumstances, will benefit from an extended programme.
3. Students who do not comply with the normal three-year BSc entrance requirements for study in the Faculty of Natural and Agricultural Sciences, may nevertheless be admitted to the Faculty in one of the BSc four-year programmes. Generally, an extended programme means that the first study year is extended to take two years. The possibility of switching over to other faculties after one or two years in the four-year programmes exists. This depends on selection rules and other conditions stipulated by the other faculties.
4. Applications for admission to the BSc four-year programmes should be submitted in accordance with the UP applications process, with applications considered up to 30 June and in a second round in August/September. Details are obtainable from the Student Administration at the Faculty of Natural and Agricultural Sciences.
5. The rules and regulations applicable to the mainstream study programmes apply mutatis mutandis to the BSc four-year programmes, with exceptions as indicated in the regulations pertaining to the BSc four-year programmes. For instance, students admitted into the BSc four-year programmes must have a National Senior Certificate with admission for degree purposes.

### Admission requirements

#### Important information for all prospective students for 2025

The admission requirements below apply to all who apply for admission to the University of Pretoria with a **National Senior Certificate (NSC) and Independent Examination Board (IEB) qualifications**. [Click here for this Faculty Brochure](#).

<b>Minimum requirements</b>
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Achievement level		
English Home Language or English First Additional Language	Mathematics	APS
NSC/IEB	NSC/IEB	
58%	65%	<b>32</b>

Life Orientation is excluded when calculating the APS.

Applicants currently in Grade 12 must apply with their final Grade 11 (or equivalent) results.

Applicants who have completed Grade 12 must apply with their final NSC or equivalent qualification results.

Please note that meeting the minimum academic requirements does not guarantee admission.

Only students that have completed school in the last two years and have not studied at a tertiary institution will be considered for this programme.

Successful candidates will be notified once admitted or conditionally admitted.

Unsuccessful candidates will also be notified.

Applicants should check their application status regularly on the UP Student Portal at [click here](#).

**Applicants with qualifications other than the abovementioned** should refer to the International undergraduate prospectus 2025: Applicants with a school leaving certificate not issued by Umalusi (South Africa), available at [click here](#).

International students: [Click here](#).

## Examinations and pass requirements

### Academic promotion requirements

Students who do not show progress during the first semester of the first year will be referred to the Admissions Committee of the Faculty.

It is expected of students who register for the first year of the BSc four-year programmes to pass all the prescribed modules of the first year.

### Progression requirement

The first year is foundational to the mainstream modules that follow; students will be limited to repeating two foundation modules during year 2 of study. Students may apply for internal transfers at the end of year 2. Not all mainstream programmes will be accessible; the Faculty's transfer guide will clearly outline all possibilities and the overarching objective will be that approved transfers will not involve adding an additional year of study.



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## Curriculum: Year 1

### Minimum credits: 100

Fundamental = 20

Core = 80

### Fundamental modules

Academic information management 111 (AIM 111) - Credits: 4.00

Academic information management 121 (AIM 121) - Credits: 4.00

Language, life and study skills 133 (LST 133) - Credits: 6.00

Language, life and study skills 143 (LST 143) - Credits: 6.00

Academic orientation 102 (UPO 102) - Credits: 0.00

### Core modules

Foundational biology 137 (BIO 137) - Credits: 8.00

Foundational biology 147 (BIO 147) - Credits: 8.00

Foundational chemistry 137 (CMY 137) - Credits: 8.00

Foundational chemistry 147 (CMY 147) - Credits: 8.00

Foundational physics 137 (PHY 137) - Credits: 8.00

Foundational physics 147 (PHY 147) - Credits: 8.00

Foundational statistics 137 (STC 137) - Credits: 8.00

Foundational statistics 147 (STC 147) - Credits: 8.00

Foundational mathematics 137 (WTW 137) - Credits: 8.00

Foundational mathematics 147 (WTW 147) - Credits: 8.00



## Curriculum: Year 2

### Minimum credits: 126

Core = 64

Elective = 62

### Additional information:

Choose electives according to the following combinations with a view to pursuing specialisation in the relevant field:

- **Physics:** PHY 114 & PHY 124 and WST 111 & WST 121 or CMY 117 & CMY 127 (64 credits)
- **Chemistry:** CMY 117 & CMY 127 and WST 111 & WST 121 or PHY 114 & PHY 124 (64 credits)
- **Economics:** WST 111, WST 121, EKN 110, EKN 120 and one of FRK 111 or OBS 114 or FBS 112 (62 credits)  
(Please note: If FRK is selected as an elective, INF 183 has to be taken as well)
- **Mathematical Statistics:** WST 111 & WST 121, EKN 110, EKN 120 and one of FRK 111 or OBS 114 or FBS 112 (62 credits)
- **Computer Science:** COS 110, COS 132, COS 151, WST 111 and WST 121 (72 credits)

Students who want to take other electives must consult the Undergraduate Programme Coordinator in the Department of Mathematics and Applied Mathematics.

### Core modules

[Calculus 114](#) (WTW 114) - Credits: 16.00

[Discrete structures 115](#) (WTW 115) - Credits: 8.00

[Numerical analysis 123](#) (WTW 123) - Credits: 8.00

[Mathematics 124](#) (WTW 124) - Credits: 16.00

[Mathematical modelling 152](#) (WTW 152) - Credits: 8.00

[Dynamical processes 162](#) (WTW 162) - Credits: 8.00

### Elective modules

[General chemistry 117](#) (CMY 117) - Credits: 16.00

[General chemistry 127](#) (CMY 127) - Credits: 16.00

[Program design: Introduction 110](#) (COS 110) - Credits: 16.00

[Imperative programming 132](#) (COS 132) - Credits: 16.00

[Introduction to computer science 151](#) (COS 151) - Credits: 8.00

[Economics 110](#) (EKN 110) - Credits: 10.00

[Economics 120](#) (EKN 120) - Credits: 10.00

[Financial management 112](#) (FBS 112) - Credits: 10.00

[Financial accounting 111](#) (FRK 111) - Credits: 10.00

[Informatics 183](#) (INF 183) - Credits: 3.00

[Business management 114](#) (OBS 114) - Credits: 10.00

[First course in physics 114](#) (PHY 114) - Credits: 16.00

[First course in physics 124](#) (PHY 124) - Credits: 16.00

[Mathematical statistics 111](#) (WST 111) - Credits: 16.00

[Mathematical statistics 121](#) (WST 121) - Credits: 16.00



## Curriculum: Year 3

**Minimum credits: 132**

Core = 84

Elective = 48

### Additional information:

Choose electives according to the following combinations with a view to pursuing specialisation in the relevant field:

- **Physics:** PHY 255 & PHY 263 (48 credits)
- **Chemistry:** CMY 282, CMY 283, CMY 284 & CMY 285 (48 credits)
- **Economics:** EKN 214, EKN 224 & EKN 234 (48 credits)
- **Mathematical Statistics:** WST 211, WST 212 & WST 221 (60 credits)
- **Computer Science:** COS 210, COS 212, COS 214 and any one of COS 216, COS 221, COS 284 (56 credits).  
Consult the Department of Computer Science for guidance on which of the additional modules is appropriate for you. Students wishing to continue with COS 332 in the third year of study should select COS 216. Students wishing to continue with COS 326 in the third year of study should select COS 221.

Students who want to take other electives must consult the Undergraduate Programme Coordinator in the Department of Mathematics and Applied Mathematics.

### Core modules

[Linear algebra 211](#) (WTW 211) - Credits: 12.00

[Calculus 218](#) (WTW 218) - Credits: 12.00

[Analysis 220](#) (WTW 220) - Credits: 12.00

[Linear algebra 221](#) (WTW 221) - Credits: 12.00

[Vector analysis 248](#) (WTW 248) - Credits: 12.00

[Discrete structures 285](#) (WTW 285) - Credits: 12.00

[Differential equations 286](#) (WTW 286) - Credits: 12.00

### Elective modules

[Physical chemistry 282](#) (CMY 282) - Credits: 12.00

[Analytical chemistry 283](#) (CMY 283) - Credits: 12.00

[Organic chemistry 284](#) (CMY 284) - Credits: 12.00

[Inorganic chemistry 285](#) (CMY 285) - Credits: 12.00

[Theoretical computer science 210](#) (COS 210) - Credits: 8.00

[Data structures and algorithms 212](#) (COS 212) - Credits: 16.00

[Software modelling 214](#) (COS 214) - Credits: 16.00

[Netcentric computer systems 216](#) (COS 216) - Credits: 16.00

[Introduction to database systems 221](#) (COS 221) - Credits: 16.00

[Computer organisation and architecture 284](#) (COS 284) - Credits: 16.00

[Economics 214](#) (EKN 214) - Credits: 16.00

[Economics 224](#) (EKN 224) - Credits: 16.00

[Economics 234](#) (EKN 234) - Credits: 16.00

[Waves, thermodynamics and modern physics 255](#) (PHY 255) - Credits: 24.00

[General physics 263](#) (PHY 263) - Credits: 24.00



[Mathematical statistics 211 \(WST 211\)](#) - Credits: 24.00

[Applications in data science 212 \(WST 212\)](#) - Credits: 12.00

[Mathematical statistics 221 \(WST 221\)](#) - Credits: 24.00



## Curriculum: Final year

**Minimum credits: 132**

Core = 72

Elective = 72

### Additional information:

Students may choose modules from Physics, Chemistry, Economics, Mathematical Statistics, Applied Mathematics, Financial Mathematics and Computer Science. Students must consult the relevant yearbook entries for admission requirements for the different honours degrees listed below.

- Students who wish to pursue an honours degree in **Physics** should take PHY 356 & PHY 364.
- Students who wish to pursue an honours degree in **Chemistry** should take CMY 382, CMY 383, CMY 384 & CMY 385.
- Students who wish to pursue an honours degree in **Economics** should take EKN 310, EKN 320, EKN 325 & WTW 383.
- Students who wish to pursue an honours degree in **Mathematical Statistics** should take WST 311, WST 312, WST 321, WST 322 & STK 353.
- Students who wish to pursue an honours degree in **Applied Mathematics** should take WTW 382, WTW 386, WTW 383 & WTW 387.
- Students who wish to pursue an honours degree in **Financial Engineering** should take WTW 354 & WTW 364, and two modules from WST 311, WST 312, WST 321 & WST 322.
- Students who wish to pursue an honours degree in **Mathematics of Finance** should take WTW 354 & WTW 364, and two modules from WST 311, WST 312, WST 321, WST 322, WTW 383 & WTW 386.
- Students who wish to pursue an honours degree in **Computer Science** should take COS 301 and any three of COS 314, COS 326, COS 330, COS 332, COS 333, COS 341 and COS 344.

Students who want to take other electives must consult the Undergraduate Programme Coordinator in the Department of Mathematics and Applied Mathematics.

### Core modules

[Analysis 310](#) (WTW 310) - Credits: 18.00

[Complex analysis 320](#) (WTW 320) - Credits: 18.00

[Algebra 381](#) (WTW 381) - Credits: 18.00

[Geometry 389](#) (WTW 389) - Credits: 18.00

### Elective modules

[Physical chemistry 382](#) (CMY 382) - Credits: 18.00

[Analytical chemistry 383](#) (CMY 383) - Credits: 18.00

[Organic chemistry 384](#) (CMY 384) - Credits: 18.00

[Inorganic chemistry 385](#) (CMY 385) - Credits: 18.00

[Software engineering 301](#) (COS 301) - Credits: 27.00

[Artificial intelligence 314](#) (COS 314) - Credits: 18.00

[Database systems 326](#) (COS 326) - Credits: 18.00

[Computer security and ethics 330](#) (COS 330) - Credits: 18.00

[Computer networks 332](#) (COS 332) - Credits: 18.00

[Programming languages 333](#) (COS 333) - Credits: 18.00

[Compiler construction 341](#) (COS 341) - Credits: 18.00



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[Computer graphics 344 \(COS 344\)](#) - Credits: 18.00  
[Economics 310 \(EKN 310\)](#) - Credits: 20.00  
[Economics 320 \(EKN 320\)](#) - Credits: 20.00  
[Economics 325 \(EKN 325\)](#) - Credits: 20.00  
[Electronics, electromagnetism and quantum mechanics 356 \(PHY 356\)](#) - Credits: 36.00  
[Statistical mechanics, solid state physics and modelling 364 \(PHY 364\)](#) - Credits: 36.00  
[The science of data analytics 353 \(STK 353\)](#) - Credits: 25.00  
[Multivariate analysis 311 \(WST 311\)](#) - Credits: 18.00  
[Stochastic processes 312 \(WST 312\)](#) - Credits: 18.00  
[Time-series analysis 321 \(WST 321\)](#) - Credits: 18.00  
[Actuarial statistics 322 \(WST 322\)](#) - Credits: 18.00  
[Financial engineering 354 \(WTW 354\)](#) - Credits: 18.00  
[Financial engineering 364 \(WTW 364\)](#) - Credits: 18.00  
[Dynamical systems 382 \(WTW 382\)](#) - Credits: 18.00  
[Numerical analysis 383 \(WTW 383\)](#) - Credits: 18.00  
[Partial differential equations 386 \(WTW 386\)](#) - Credits: 18.00  
[Continuum mechanics 387 \(WTW 387\)](#) - Credits: 18.00

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### **General Academic Regulations and Student Rules**

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. The G Regulations are updated annually and may be amended after the publication of this information.

### **Regulations, degree requirements and information**

The faculty regulations, information on and requirements for the degrees published here are subject to change and may be amended after the publication of this 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 (HEQSF) 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.