University of Pretoria Yearbook 2020

BSc Applied Mathematics (02133253)

Minimum duration of study	3 years
Total credits	414
NQF level	07
Contact	Prof R Anguelov roumen.anguelov@up.ac.za +27 (0)124202520

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 Admission Point Score (APS).
- Grade 11 results are used for the conditional admission of prospective students. Final admission is based on the Grade 12 results.

Minimum requirements				
Achievement level				
English Home Language or English First Additional Language		**Mathematics**		**APS**
NSC/IEB	AS Level	NSC/IEB	AS Level	
5	C	6	B	**34**

* Cambridge A level candidates who obtained at least a D in the required subjects, will be considered for admission. International Baccalaureate (IB) HL candidates who obtained at least a 4 in the required subjects, will be considered for admission.

Candidates who do not comply with the minimum admission requirements for BSc (Applied Mathematics), may be considered for admission to the BSc – Extended programme – Mathematical Sciences. This programme takes a year longer than the normal programmes to complete.

BSc – Extended programme – Mathematical Sciences				
Minimum requirements				
Achievement level				
English Home Language or English First Additional Language		**Mathematics**		**APS**
NSC/IEB	AS Level	NSC/IEB	AS Level	
4	D	5	C	**28**

Other programme-specific information

The Dean may, on the recommendation of the programme manager, approve deviations with regard to the composition of the study programme.

It remains the student's responsibility to acertain, prior to registration, whether they comply with the prerequisites of the modules they want to register for.

The prerequisites are listed in the Alphabetical list of modules.

A student must pass all the minimum prescribed and elective module credits as set out at the end of each year within a programme as well as the total required credits to comply with the particular degree programme. Please refer to the curricula of the respective programmes. At least 144 credits must be obtained at 300-/400-level, or otherwise as indicated by curriculum. The minimum module credits needed to comply with degree requirements is set out at the end of each study programme. Subject to the programmes as indicated a maximum of 150 credits will be recognised at 100-level. A student may, in consultation with the relevant head of department and subject to the permission by the Dean, select or replace prescribed module credits not indicated in BSc three-year study programmes to the equivalent of a maximum of 36 module credits.

It is important that the total number of prescribed module credits is completed during the course of the study programme. The Dean may, on the recommendation of the relevant head of department, approve deviations in this regard. Subject to the programmes as indicated in the respective curricula, a student may not register for more than 75 module credits per semester at first-year level subject to permission by the Dean. A student may be permitted to register for up to 80 module credits in a the first semester during the first year provided that he or she obtained a final mark of no less than 70% for grade 12 Mathematics and achieved an APS of 34 or more in the NSC.

Students who are already in possession of a bachelor's degree, will not receive credit for modules of which the content overlap with modules from the degree that was already conferred. Credits will not be considered for more than half the credits passed previously for an uncompleted degree. No credits at the final-year or 300- and 400-level will be granted.

Promotion to next study year

A student will be promoted to the following year of study if he or she passed 100 credits of the prescribed credits for a year of study, unless the Dean on the recommendation of the relevant head of department decides otherwise. A student who does not comply with the requirements for promotion to the following year of study, retains the credit for the modules already passed and may be admitted by the Dean, on recommendation of the relevant head of department, to modules of the following year of study to a maximum of 48 credits, provided that it will fit in with both the lecture and examination timetable.

General promotion requirements in the faculty

All students whose academic progress is not acceptable can be suspended from further studies.

- A student who is excluded from further studies in terms of the stipulations of the abovementioned regulations, will be notified in writing by the Dean or Admissions Committee at the end of the relevant semester.
- A student who has been excluded from further studies may apply in writing to the Admissions Committee of the Faculty of Natural and Agricultural Sciences for re-admission.
- Should the student be re-admitted by the Admissions Committee, strict conditions will be set which the student must comply with in order to proceed with his/her studies.

- Should the student not be re-admitted to further studies by the Admissions Committee, he/she will be informed in writing.
- Students who are not re-admitted by the Admissions Committee have the right to appeal to the Senate Appeals Committee.
- Any decision taken by the Senate Appeals Committee is final.

Pass with distinction

A student obtains his or her degree with distinction if all prescribed modules at 300-level (or higher) are passed in one academic year with a weighted average of at least 75%, and obtain at least a subminimum of 65% in each of the relevant modules.

Curriculum: Year 1

Minimum credits: 138

Fundamental = 12 credits

Core = 96 credits

Elective = 30 credits

Additional information:

Students who do not qualify for AIM 102 must register for AIM 111 and AIM 121.

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

Physics: PHY 114 & PHY 124 (32 credits)

Chemistry: CMY 117 & CMY 127 (32 credits)

Economics: EKN 110, EKN 120 and one of FRK 111 or OBS 114 or FBS 112 (30 credits)

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

Fundamental modules

Academic information management 102 (AIM 102) - Credits: 6.00
Academic information management 111 (AIM 111) - Credits: 4.00
Academic information management 121 (AIM 121) - Credits: 4.00
Language and study skills 110 (LST 110) - Credits: 6.00
Academic orientation 102 (UPO 102) - Credits: 0.00

Core modules

Mathematical statistics 111 (WST 111) - Credits: 16.00
Mathematical statistics 121 (WST 121) - Credits: 16.00
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
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
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

Curriculum: Year 2

Minimum credits: 132

Core = 84 credits

Elective = 48 credits

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)

Statistics: WST 211 & WST 221 (48 credits)

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
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
Mathematical statistics 221 (WST 221) - Credits: 24.00

Curriculum: Final year

Minimum credits: 144

Core = 90 credits

Elective = 54 credits

Additional information:

Students may choose elective modules from Physics, Chemistry, Economics, Mathematical Statistics, Mathematics and Financial Mathematics.

1. **Students who wish to pursue an honours degree in Physics** should take PHY 356 & PHY 364.
2. **Students who wish to pursue an honours degree in Chemistry** should take CMY 382, CMY 383 ,CMY 384 & CMY 385, with one of the modules for non-degree purposes.
3. **Students who wish to pursue an honours degree in Economics** should take EKN 310, EKN 320 & EKN 325
4. **Students who wish to pursue an honours degree in Mathematical Statistics** should take WST 311, WST 312, WST 321, WST 322 & STK 353, with two of the modules for non-degree purposes.
5. **Students who wish to pursue an honours degree in Mathematics** should take WTW 381, WTW 320 & WTW 389.
6. **Students who wish to pursue an honours degree in Financial Mathematics** should take WTW 354 & WTW 364, and one module from WST 311, WST 312, WST 321 & WST 322.

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
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

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
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

Complex analysis 320 (WTW 320) - Credits: 18.00
Financial engineering 354 (WTW 354) - Credits: 18.00
Financial engineering 364 (WTW 364) - Credits: 18.00
Algebra 381 (WTW 381) - Credits: 18.00
Geometry 389 (WTW 389) - Credits: 18.00

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.