

# University of Pretoria Yearbook 2016

## BSc Environmental Sciences (02133361)

**Duration of study** 3 years

**Total credits** 434

### Admission requirements

- In order to register NSC/IEB/Cambridge candidates must comply with the minimum requirements for degree studies as well as the minimum requirements for the relevant study programme.
- Life Orientation is excluded in the calculation of the Admission Point Score (APS).
- Grade 11 results are used for the provisional admission of prospective students.
- Final admission is based on the Grade 12 results.

Minimum requirements for 2016												
Achievement level												
Afrikaans or English				Mathematics				Physical Sciences				APS
NSC/IEB	HIGCSE	AS-Level	A-Level	NSC/IEB	HIGCSE	AS-Level	A-Level	NSC/IEB	HIGCSE	AS-Level	A-Level	
5	3	C	C	5	3	C	C	5	3	C	C	32

Candidates who do not comply with the minimum admission requirements may be considered for admission to the BSc or the BSc (Four-year Programme) based on the results of the NBT.

### Other programme-specific information

**Students can take WTW 114 instead of WTW 134 if they meet the entry requirement.**

**Students may enrol for AIM 111 and AIM 121 instead of AIM 102 (the same content presented over 2 semesters).**

BSc (Geography) and BSc (Environmental Sciences) students may register for WKD 155. Students are not allowed to earn credits for both WKD 155 and WKD 164.

**Electives can be chosen from the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Physics, Chemistry, Plant Science , Mathematics and Applied Mathematics,**

## Zoology and Entomology, Anthropology and Archaeology and Computer Science.

Electives are chosen as follows:

First year – 6 credits

Second year – 60 credits

Third year – 60 credits

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 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 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 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.

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

Please note: Where elective modules are not specified, these may be chosen from any modules appearing in the list of modules.

It remains the student's responsibility to ascertain, 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.

## Transitional measures

### Transitional measures for Mathematics modules for 2016

- Students who would have registered for any of the degrees BSc in Environmental Sciences, Geography, Geoinformatics, BCom, BCom in Economics/Statistics or BScIT Information and Knowledge Systems prior to 2016, and not successfully completed WTW 114, WTW 126 or WTW 128 will be allowed to register for WTW

134, WTW 146 and WTW 148, respectively.

- Students who would have registered for BSc in Geology prior to 2016, and not successfully completed WTW 114, WTW 126 or WTW 128 will be allowed to register for WTW 158, WTW 164 or WTW 124 or WTW 148, respectively.
- Students who registered prior to 2016, and who failed both WTW 126 and WTW 128 will register for WTW 124 in 2016 if they wish to continue with mathematics at 200 level, or if WTW 126 and WTW 128 are required for their respective degree programmes.
- Students who do not qualify for WTW 146 and WTW 148 in terms of their degree programmes, and failed one of WTW 126 or WTW 128, will be allowed to register for the respective module in 2016, and will attend the relevant lectures and tutorials of WTW 124. They will write separate semester tests and exams, covering just the relevant material from WTW 124.
- Students who registered prior to 2016 and passed WTW 126 but not WTW 128, will be allowed to continue with WTW 211 and COS 344 in 2016.
- Students who registered prior to 2016 and passed WTW 128 but not WTW 126, will be allowed to continue with the modules WTW 220, IAS 211 and GLY 265 in 2016, if they also meet the additional entry requirements.
- Students who registered prior to 2016, and who failed both WTW 161 and WTW 168 will register for WTW 164 in 2016.
- Students who failed one of WTW 161 or WTW 168, will be allowed to register for the respective module in 2016, and will attend the relevant lectures and tutorials of WTW 164. They will write separate semester tests and exams, covering just the relevant material from WTW 164.

## 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 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 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 Senior Appeals Committee.
- Any decision taken by the Senior 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: 140**

## Fundamental modules

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

Academic information management 102 (AIM 102) - Credits: 6.00

## Core modules

Biometry 120 (BME 120) - Credits: 16.00

Plant biology 161 (BOT 161) - Credits: 8.00

General chemistry 117 (CMY 117) - Credits: 16.00

General chemistry 127 (CMY 127) - Credits: 16.00

Aspects of human geography 156 (GGY 156) - Credits: 8.00

Southern African geomorphology 166 (GGY 166) - Credits: 8.00

Molecular and cell biology 111 (MLB 111) - Credits: 16.00

Climate and weather of Southern Africa 164 (WKD 164) - Credits: 8.00

Mathematics 134 (WTW 134) - Credits: 16.00

Animal diversity 161 (ZEN 161) - Credits: 8.00

Introduction to environmental sciences 101 (ENV 101) - Credits: 8.00

## Curriculum: Year 2

**Minimum credits: 144**

### Core modules

South African flora and vegetation 251 (BOT 251) - Credits: 12.00  
Plant physiology and biotechnology 261 (BOT 261) - Credits: 12.00  
Process geomorphology 252 (GGY 252) - Credits: 12.00  
Introductory geographic information systems 283 (GGY 283) - Credits: 12.00  
Introductory soil science 250 (GKD 250) - Credits: 12.00  
Invertebrate biology 251 (ZEN 251) - Credits: 12.00  
African vertebrates 261 (ZEN 261) - 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  
Geomorphology of the built environment 265 (GGY 265) - Credits: 12.00  
Geographic data analysis 220 (GIS 220) - Credits: 12.00  
Geographic information systems introduction 221 (GIS 221) - Credits: 12.00  
Sedimentology 253 (GLY 253) - Credits: 12.00  
Structural geology 254 (GLY 254) - Credits: 12.00  
Igneous petrology 261 (GLY 261) - Credits: 12.00  
Metamorphic petrology 262 (GLY 262) - Credits: 12.00  
Groundwater 265 (GLY 265) - Credits: 12.00  
Remote sensing 220 (GMA 220) - Credits: 16.00  
General physics 263 (PHY 263) - Credits: 24.00  
Surveying 210 (SUR 210) - Credits: 16.00  
Surveying 220 (SUR 220) - Credits: 16.00  
Strength of materials 210 (SWK 210) - Credits: 16.00  
Site surveying 213 (TRN 213) - Credits: 12.00  
Physical meteorology 261 (WKD 261) - Credits: 14.00  
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  
Differential equations 256 (WTW 256) - Credits: 8.00  
Calculus 258 (WTW 258) - Credits: 8.00  
Numerical methods 263 (WTW 263) - Credits: 8.00  
Discrete structures 285 (WTW 285) - Credits: 12.00  
Differential equations 286 (WTW 286) - Credits: 12.00  
Waves, thermodynamics and modern physics 255 (PHY 255) - Credits: 24.00  
City structure, environment and society 266 (GGY 266) - Credits: 24.00  
Fundamental and applied mineralogy 255 (GLY 255) - Credits: 24.00  
Basic principles of pasture science 253 (WDE 253) - Credits: 18.00  
Vector analysis 248 (WTW 248) - Credits: 12.00



[Introduction to dynamic meteorology 263](#) (WKD 263) - Credits: 14.00

[Differential equations 264](#) (WTW 264) - Credits: 12.00

## Curriculum: Final year

**Minimum credits: 144**

### Core modules

Environmental geomorphology 361 (GGY 361) - Credits: 18.00  
Geographic information systems 310 (GIS 310) - Credits: 24.00  
Spatial analysis 320 (GIS 320) - Credits: 24.00  
Human environmental interactions 301 (ENV 301) - Credits: 18.00

### Elective modules

Plant ecophysiology 356 (BOT 356) - Credits: 18.00  
Plant ecology 358 (BOT 358) - Credits: 18.00  
Phytomedicine 365 (BOT 365) - Credits: 18.00  
Plant diversity 366 (BOT 366) - Credits: 18.00  
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  
Applied geomorphology 363 (GGY 363) - Credits: 12.00  
Soil chemistry 320 (GKD 320) - Credits: 14.00  
Soil classification and surveying 350 (GKD 350) - Credits: 14.00  
Ore deposits 361 (GLY 361) - Credits: 18.00  
Geostatistics and ore reserve calculations 362 (GLY 362) - Credits: 18.00  
Engineering geology 363 (GLY 363) - Credits: 18.00  
Remote sensing 320 (GMA 320) - Credits: 24.00  
Geometrical and space geodesy 310 (GMC 310) - Credits: 24.00  
Soil-water relationship and irrigation 350 (PGW 350) - Credits: 16.00  
Statistical mechanics, solid state physics and modelling 364 (PHY 364) - Credits: 36.00  
Soil mechanics 311 (SGM 311) - Credits: 16.00  
Principles of veld management 310 (WDE 310) - Credits: 14.00  
Planted pastures and fodder crops 320 (WDE 320) - Credits: 14.00  
Atmospheric vorticity and divergence 352 (WKD 352) - Credits: 18.00  
Quasi-geostrophic analysis 361 (WKD 361) - Credits: 18.00  
Analysis 310 (WTW 310) - 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  
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  
Geometry 389 (WTW 389) - Credits: 18.00  
Population ecology 351 (ZEN 351) - Credits: 18.00  
Mammalogy 352 (ZEN 352) - Credits: 18.00  
Community ecology 353 (ZEN 353) - Credits: 18.00





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[Evolutionary physiology 354](#) (ZEN 354) - Credits: 18.00  
[Insect diversity 355](#) (ZEN 355) - Credits: 18.00  
[Physiological processes 361](#) (ZEN 361) - Credits: 18.00  
[Evolution and phylogeny 362](#) (ZEN 362) - Credits: 18.00  
[Behavioural ecology 363](#) (ZEN 363) - Credits: 18.00  
[Conservation ecology 364](#) (ZEN 364) - Credits: 18.00  
[Applied entomology 365](#) (ZEN 365) - Credits: 18.00  
[Electronics, electromagnetism and quantum mechanics 356](#) (PHY 356) - Credits: 36.00  
[Sustainable development 356](#) (GGY 356) - Credits: 18.00  
[Development frameworks 366](#) (GGY 366) - Credits: 18.00  
[Rock mechanics 364](#) (GLY 364) - Credits: 18.00  
[Plant genetics and crop biotechnology 361](#) (BTC 361) - Credits: 18.00  
[Fundamentals of weather forecasting 366](#) (WKD 366) - Credits: 36.00

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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.