

# University of Pretoria Yearbook 2022

## BScHons (Applied Science) *Environmental Technology* (12243008)

**Department** Chemical Engineering

**Minimum duration of study** 1 year

**Total credits** 128

**NQF level** 08

### Programme information

The BScHons (Applied Science) degree is conferred by the following academic departments:

- Chemical Engineering
- Civil Engineering
- Industrial and Systems Engineering
- Materials Science and Metallurgical Engineering
- Mechanical and Aeronautical Engineering
- Mining Engineering

Any specific module is offered on the condition that a minimum number of students are registered for the module, as determined by the relevant head of department and the Dean. Students must consult the relevant head of department in order to compile a meaningful programme, as well as on the syllabi of the modules. The relevant departmental postgraduate brochures must also be consulted.

### Admission requirements

1. Three-year BSc (or equivalent) degree (in Natural Sciences)  
with a cumulative weighted average of at least 60% for the degree  
and  
a full year of Mathematics, Physics and Chemistry passed at least at first-year level (modules entitled "Introductory", "Elementary" or "Basic" will not be regarded as acceptable)  
or  
relevant BTech qualification excluding the National Diploma; i.e. one offered by a department of chemical engineering at a university of technology in South Africa  
with a cumulative weighted average of at least 75% for the degree  
and  
no modules failed in the BTech degree  
or  
four-year engineering-based university degree not recognised by ECSA for registration as a professional engineer

and

a full year of Mathematics, Physics and Chemistry passed at least at first-year level (modules entitled “Introductory”, “Elementary” or “Basic” will not be regarded as acceptable)

or

BEng degree awarded by the University of Pretoria

or

relevant four-year bachelor’s degree in engineering that the Engineering Council of South Africa (ECSA) regards as acceptable for registration as a candidate engineer and for eventual registration as a professional engineer

2. An entrance examination may be required

3. Comprehensive intellectual CV

## Other programme-specific information

A limited number of appropriate postgraduate modules from other departments are allowed. Not all modules listed are presented each year. Please consult the departmental postgraduate brochure.

## Examinations and pass requirements

Refer also to G18 and G26.

- i. The examination in each module for which a student is registered, takes place during the normal examination period after the conclusion of lectures (i.e. October/November or May/June).
- ii. G18(1) applies with the understanding that under exceptional circumstances an extension of a maximum of three years may be approved: provided that the Dean, on recommendation of the relevant head of department, may approve a stipulated limited extension of this period.
- iii. A student must obtain at least 50% in an examination for each module where no semester or year mark is required. A module may only be repeated once.
- iv. In modules where semester or year marks are awarded, a minimum examination mark of 40% and a final mark of 50% is required.
- v. No supplementary or special examinations are granted at postgraduate level.

## Pass with distinction

A student passes with distinction if he or she obtains a weighted average of at least 75% (not rounded) in the first 128 credits for which he or she has registered (excluding modules which were discontinued timeously). The degree is not awarded with distinction if a student fails any one module (excluding modules which were discontinued timeously). The degree must be completed within the prescribed study period.



## Curriculum: Final year

Minimum credits: 128

### Core modules

#### Air quality control 787 (CAM 787)

Module credits	32.00
NQF Level	08
Prerequisites	Admission to relevant programme.
Contact time	32 contact hours per semester
Language of tuition	Module is presented in English
Department	Chemical Engineering
Period of presentation	Semester 1 or Semester 2

##### Module content

Air quality awareness and impacts of air pollutants. South African air pollution legislation. Meteorology and dispersion modelling. Measurement of air pollution – sampling and analysis. Equipment design of settling chambers and cyclones. Venturis and other wet cleaning equipment. Bag filters. Electrostatic precipitators. Incinerators, adsorption and absorption equipment.

#### Principles of environmental engineering 787 (CEM 787)

Module credits	32.00
NQF Level	08
Prerequisites	Admission to relevant programme.
Contact time	32 contact hours per semester
Language of tuition	Module is presented in English
Department	Chemical Engineering
Period of presentation	Semester 1 or Semester 2

##### Module content

Engineering principles for environmental preservation and management, pollution control, life-cycle assessment, interactions in the macro and micro-environments, global and ecological systems, social-economic factors in environmental systems, predictive models for the current and future environment, environmental engineering as the driver of economic systems.

#### Industrial waste engineering 787 (WAI 787)

Module credits	32.00
NQF Level	08
Prerequisites	Admission to relevant programme.

<b>Contact time</b>	32 contact hours per semester
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Chemical Engineering
<b>Period of presentation</b>	Semester 2

#### Module content

Identification of source materials, physical and chemical properties of waste. Release and transport mechanisms from source to air, groundwater, soil. Primary pathways of contaminants including sorption, volatilisation, biotic and abiotic transformations. Toxicology: absorption, distribution, biochemical transformation, and secretion of chemicals. Acute and chronic toxicity quantification and evaluation of risk. Hazard identification, exposure assessment, toxicity assessment and risk characterisation. Minimum requirements for the handling, classification and disposal of hazardous waste. Minimum requirements for waste disposal by landfill. Minimum requirements for water monitoring at waste management facilities. Recycling and resource management. Waste prevention, minimisation and optimisation.

### Water quality management and research 787 (WQB 787)

<b>Module credits</b>	32.00
<b>NQF Level</b>	08
<b>Contact time</b>	32 contact hours per semester
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Chemical Engineering
<b>Period of presentation</b>	Semester 1 or Semester 2

#### Module content

Water quality parameters: physical, chemical, biological, microbiological; Units of expression; Evaluation of parameters; Methods of analysis and practical laboratory analyses; Water quality interpretation, evaluation and assessment, water quality guidelines and requirements for domestic, industrial, agricultural, ecological, recreational requirements; Limnology and water quality in rivers and lakes; Surface water modelling; Ground water quality and assessment; Regulatory aspects including all relevant legislation; Integrated environmental management, integrated pollution control; Procedures to assess effluent discharge impacts; and Water quality management, policies and procedures, role of catchment management agencies, and catchment management plans.

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.