

# University of Pretoria Yearbook 2017

## BScHons Applied Science Chemical Technology (12243004)

**Duration of study** 1 year

**Total credits** 128

### 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 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

An appropriate bachelor's degree, a BTech degree or equivalent qualification is required for admission.

### 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.

Specialisation in Process Technology is possible by registering for specific modules. (Please note that a candidate selecting this option will not be allowed to register for any modules at 700-level before the modules of the first semester at 400-level had been completed successfully.) Please consult the department.

The modules CPB 410, CBI 410 and CSS 420 do not form part of the postgraduate block presentations. Individual arrangements have to be made with the relevant lecturer regarding attendance of lectures, study material, tests and assignments.



## Curriculum: Final year

Minimum credits: 128

### Core modules

#### Process integration 732 (CIP 732)

|                        |                                |
|------------------------|--------------------------------|
| Module credits         | 32.00                          |
| Prerequisites          | No prerequisites.              |
| Contact time           | 44 contact hours per semester  |
| Language of tuition    | Module is presented in English |
| Academic organisation  | Chemical Engineering           |
| Period of presentation | Semester 1                     |

#### Chemical engineering 707 (CIR 707)

|                        |                                |
|------------------------|--------------------------------|
| Module credits         | 32.00                          |
| Prerequisites          | No prerequisites.              |
| Contact time           | 8 contact hours per semester   |
| Language of tuition    | Module is presented in English |
| Academic organisation  | Chemical Engineering           |
| Period of presentation | Year                           |

#### Chemical Engineering 787 (CIR 787)

|                        |                                |
|------------------------|--------------------------------|
| Module credits         | 16.00                          |
| Prerequisites          | No prerequisites.              |
| Contact time           | 10 lectures per week           |
| Language of tuition    | Module is presented in English |
| Academic organisation  | Chemical Engineering           |
| Period of presentation | Semester 1 or Semester 2       |

#### Carbon materials science research and technology 732 (CMS 732)

|                        |                                |
|------------------------|--------------------------------|
| Module credits         | 32.00                          |
| Prerequisites          | No prerequisites.              |
| Contact time           | 10 lectures per week           |
| Language of tuition    | Module is presented in English |
| Academic organisation  | Chemical Engineering           |
| Period of presentation | Semester 1 or Semester 2       |



### Process control 410 (CPB 410)

|                               |   |
|-------------------------------|---|
| <b>Module credits</b>         | 16.00                                     |
| <b>Prerequisites</b>          | CPN 321 GS                                |
| <b>Contact time</b>           | 3 tutorials per week, 4 lectures per week |
| <b>Language of tuition</b>    | Module is presented in English            |
| <b>Academic organisation</b>  | Chemical Engineering                      |
| <b>Period of presentation</b> | Semester 1                                |

#### Module content

Dynamic properties of equipment, instruments and processes. Mathematical modelling and computer simulation of processes in the time, Laplace and frequency domains. Linearisation and non-linear processes. Stability of control systems. Controller tuning. Methods for process identification. Digital process control. Z-transforms. Use of computers and microprocessors. Introduction to modern control theory: state-space approach. Applied process control. Choice of control instrumentation. Plantwide control strategy. Development of P and ID's.

### Product design 732 (CPO 732)

|                               |                                |
|-------------------------------|--------------------------------|
| <b>Module credits</b>         | 32.00                          |
| <b>Prerequisites</b>          | No prerequisites.              |
| <b>Contact time</b>           | 24 contact hours per semester  |
| <b>Language of tuition</b>    | Module is presented in English |
| <b>Academic organisation</b>  | Chemical Engineering           |
| <b>Period of presentation</b> | Semester 1                     |

### Polymer processing 732 (CPP 732)

|                               |                                |
|-------------------------------|--------------------------------|
| <b>Module credits</b>         | 32.00                          |
| <b>Prerequisites</b>          | No prerequisites.              |
| <b>Contact time</b>           | 32 contact hours per semester  |
| <b>Language of tuition</b>    | Module is presented in English |
| <b>Academic organisation</b>  | Chemical Engineering           |
| <b>Period of presentation</b> | Semester 1 or Semester 2       |

### Polymer materials science and research 732 (CPW 732)

|                              |                                |
|------------------------------|--------------------------------|
| <b>Module credits</b>        | 32.00                          |
| <b>Prerequisites</b>         | No prerequisites.              |
| <b>Contact time</b>          | 32 contact hours per semester  |
| <b>Language of tuition</b>   | Module is presented in English |
| <b>Academic organisation</b> | Chemical Engineering           |

**Period of presentation** Semester 1

### Reactor design 410 (CRO 410)

**Module credits** 16.00

**Prerequisites** CKN 321 GS

**Contact time** 3 tutorials per week, 4 lectures per week

**Language of tuition** Module is presented in English

**Academic organisation** Chemical Engineering

**Period of presentation** Semester 1

#### Module content

Heterogeneous catalysis: diffusion in reaction for catalyst pores and different catalyst geometries. Inter and intraparticle heat and mass transfer processes. Reactor design: energy and continuity equation for different types of reactor: stirred tank, pipe, radial flow, slurry and fluidised. Modelling of non-ideal flow in reactors.

### Separation technology 732 (CSK 732)

**Module credits** 32.00

**Prerequisites** No prerequisites.

**Contact time** 32 contact hours per semester

**Language of tuition** Module is presented in English

**Academic organisation** Chemical Engineering

**Period of presentation** Semester 1

### Specialisation 420 (CSS 420)

**Module credits** 16.00

**Prerequisites** CPJ 421#

**Contact time** 4 lectures per week

**Language of tuition** Module is presented in English

**Academic organisation** Chemical Engineering

**Period of presentation** Semester 2

#### Module content

A module to be selected from the list of available specialisation topics, including Process Control, Chemical Product Design, Environmental Engineering, Nuclear Engineering, Polymer Processing, Reactor Design, and Water Utilisation Engineering.

### Additive technology 732 (CYM 732)

**Module credits** 32.00

**Prerequisites** No prerequisites.



|                               |                                |
|-------------------------------|--------------------------------|
| <b>Contact time</b>           | 32 contact hours per semester  |
| <b>Language of tuition</b>    | Module is presented in English |
| <b>Academic organisation</b>  | Chemical Engineering           |
| <b>Period of presentation</b> | Semester 1                     |

### Fluoro-materials science research and technology 732 (CFT 732)

|                               |                                |
|-------------------------------|--------------------------------|
| <b>Module credits</b>         | 32.00                          |
| <b>Prerequisites</b>          | No prerequisites.              |
| <b>Contact time</b>           | 2 lectures per week            |
| <b>Language of tuition</b>    | Module is presented in English |
| <b>Academic organisation</b>  | Chemical Engineering           |
| <b>Period of presentation</b> | Semester 2                     |

### Bioprocessing 732 (CBP 732)

|                               |                                |
|-------------------------------|--------------------------------|
| <b>Module credits</b>         | 32.00                          |
| <b>Prerequisites</b>          | No prerequisites.              |
| <b>Contact time</b>           | 32 contact hours per semester  |
| <b>Language of tuition</b>    | Module is presented in English |
| <b>Academic organisation</b>  | Chemical Engineering           |
| <b>Period of presentation</b> | Semester 1                     |

#### Module content

Description of industrial biotechnology in a process engineering environment. Focus on specific applications in the mining, agricultural, paper and pulp, medical, pharmaceutical, veterinary, brewing and food industries. Principles including implications of bio-prospecting, bio-safety, inoculum production, aseptic growth, quality control and product formulation as applicable to bio-processes. Fermentation with various microbial groups, bio-leaching, gene transfer, solid-substrate fermentation, enzymatic catalysis and immunology. Bioreactors, batch and continuous processing. Bio-remediation.

### Particle technology 410 (CPA 410)

|                               |   |
|-------------------------------|---|
| <b>Module credits</b>         | 16.00                                     |
| <b>Prerequisites</b>          | COP 311                                   |
| <b>Contact time</b>           | 3 tutorials per week, 4 lectures per week |
| <b>Language of tuition</b>    | Module is presented in English            |
| <b>Academic organisation</b>  | Chemical Engineering                      |
| <b>Period of presentation</b> | Semester 1                                |

## Module content

Humidification and dehumidification of air. Water cooling, drying, crystallisation, ion exchange, particle technology, particle movement in a fluid, sedimentation. Hydrocyclones, flotation, filtration. Centrifuges. Fluidised bed technology. Mixing. Comminution. Pneumatic transport.

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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.