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# University of Pretoria Yearbook 2017

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## Faculty of Engineering, Built Environment and Information Technology

### **Welcome to the Faculty of Engineering, Built Environment and Information Technology**

The Faculty is a leading source of locally relevant and internationally competitive programmes in Engineering, the Built Environment and Information Technology, at both undergraduate and graduate levels. It attracts high-quality students and staff, and offers extended programmes to facilitate inclusiveness. It is well resourced in terms of teaching and research facilities, and houses several research institutes. The Faculty maintains close links with industry that supports both the teaching and research programmes. The multidisciplinary nature of the Faculty facilitates interaction across disciplines in both teaching and research activities.

### Faculty regulations and information

*The rules for the degrees published in this Yearbook are subject to change and may be amended prior to the commencement of the academic year.*

*The General Regulations (G Regulations) apply to all faculties of the University of Pretoria. It is expected of each student to familiarise himself or herself well with these regulations. Ignorance concerning these regulations will not be accepted as an excuse for any transgression.*

Please read the faculty regulations in conjunction with the General Regulations.

#### **Academic literacy**

It is expected of all new undergraduate students who wish to study at the University to sit for an academic literacy test. Certain modules which address shortcomings in this respect, are included in the undergraduate curriculum. In addition, modules which have the purpose of developing specific language and communication skills in the context of the requirements of the engineering profession are also included in the curriculum.

#### **Change of field of study**

Transfer from one field of study to another may only take place with the Dean's approval, after consultation with the relevant Head of Department.

#### **Examinations**

##### **Examinations, projects and research reports/mini-dissertations**

- i. An examination in a module may be written and/or oral. Projects and research reports/mini-dissertations are prepared and examined as stipulated in the study guide of the module, in accordance with the regulations and procedures as described below.
- ii. The examinations for modules of the first semester are held in May/June, while all other examinations (third and fourth-quarter modules, second-semester modules and year modules) are held in October/November.

#### **Examination admission**

A minimum semester/year mark of 40% is required in order to be admitted to the final examination in a specific module. with the exception of first-semester modules at first-year level where a minimum semester mark of 30% is required for admission to an examination. In addition, all other examination admission requirements,



applicable to the relevant module, must have been met.

### Special examinations (including the aegrotat)

Refer to G Regulation G.12.5.

- i. A medical certificate stating that a student appeared ill or declared him-/herself unfit to write the examination **will not be accepted.**
- ii. The doctor must be consulted **on or before the date** on which the examination was scheduled.

### Ancillary examinations

Refer to G Regulation G.12.3.

Please note: No ancillary or special examinations are granted in any design modules (all ONT modules) in the Department of Architecture.

### Other special examinations

Refer also to G Regulation G.12.6.

- i. The Dean may, on the recommendation of the Head of Department concerned, grant a special examination in a module to a student who failed that module in the final year of study, and consequently does not comply with degree requirements.
- ii. In the schools of **Built Environment** and **Information Technology**: A student may at most, be admitted to either one special examination in a year module or two special examinations in semester modules or four special examinations in quarter modules.
- iii. In the **School of Engineering**: A student may be granted at the most two such special examinations. To be taken into consideration for a special examination, a student should have obtained a minimum final mark of 40% and should also have complied with all other examination admission requirements which are applicable to the relevant module.
- iv. A student must apply in writing to the Dean before consideration will be given to admission to a special examination. The Head of Department decides when the special examination will take place and may prescribe work that must be satisfactorily completed before a student may write the examination.
- v. During calculation of the final mark the semester mark is retained and the final mark is calculated as the weighted average of the special examination mark and the semester mark, in accordance with the formula as published in the study guide of the specific module. The candidate should also comply with the subminimum requirements. The highest final mark that may be awarded is 50%.

### Please note:

- In the **School for the Built Environment**, the pass mark required for a special examination is 50%, a higher mark is not allocated and the semester/year mark is not taken into consideration.
- **School for Information Technology**: If a test or examination clash occurs between modules within the prescribed curriculum, an adjustment of the test date and/or time will only be considered if the student completes an official application form at the department's administration office and submits a copy and supporting documentation to the relevant lecturer at least seven (7) days prior to the scheduled test. A module from a higher year level receives preference to that of a lower year level within the prescribed curriculum.
- In the **School of Engineering**: no special examinations will be allowed for modules with a project or design component in any discipline of engineering. No other special examinations are granted in the School of Engineering.

### Re-marking of examination scripts

Refer to G Regulation G.14.

### Supplementary examinations in the School of Engineering



Refer to General Regulation G.12.4.

In the School of Engineering a supplementary examination is only granted in instances where:

- i. A final mark of between 45% and 49% was achieved;
- ii. A final mark of between 40% and 44% was achieved and where the candidate also achieved either a semester mark or an examination mark of 50% or higher;
- iii. A pass mark has been obtained, but the required subminimum in the examination section of the module or divisions thereof has not been obtained.
- iv. A final mark of between 40% and 49% has been obtained in first-year modules in the first semester.

Calculation of the final supplementary examination mark:

- i. The semester mark is retained and the final mark is calculated as the weighted average of the supplementary examination mark and the semester mark, in accordance with the formula as published in the study manual of the specific module, with the proviso that the maximum final mark awarded may be no more than 50%. The only exception to this rule is in the case of first-year modules at first-semester level, where the semester mark is not considered, and where the supplementary examination mark is taken as the final mark, with the proviso that the maximum final mark awarded may be no more than 50%.
- ii. All other pass requirements, as published in the study manual of each specific module, remain so and are applicable during the determination of the final result of a supplementary examination in the module.

Special supplementary examinations will not be arranged for students who were not able to write the supplementary examinations during scheduled times, as given in the examinations timetable.

### **Supplementary examinations in the School for the Built Environment**

Refer to G Regulation G.12.4.

Except for first-semester modules in the first year where supplementary examinations are compulsory between 40% and 49%, a supplementary examination is only granted in instances where:

- i. a final mark of between 45% and 49% was obtained;
- ii. a final mark of between 40% and 44% was obtained and where the candidate also obtained either a semester mark or an examination mark of 50% or higher;
- iii. a pass mark has been obtained, but the required subminimum in the examination section of the module or divisions thereof has not been obtained.

Regulations (i) to (iii) do not apply to third-year modules of any of the programmes in the Department of Architecture. No supplementary examinations are granted in any year of study for the design module (ONT modules).

### **Supplementary examinations in the School of Information Technology**

Refer to G Regulation G.12.4.

In the School of Information Technology all supplementary examinations are considered and granted in accordance with the stipulations of G Regulation G.12.4, except that the semester mark is taken into account when the final mark is calculated and in accordance with the faculty regulations of the faculty in which the module is offered. The only exception to this rule is in the case of first-year modules at first-semester level, where the semester mark is not considered, and where the supplementary examination mark is taken as the final mark, with the provision that the maximum final mark awarded may be no more than 50%. Special supplementary examinations will not be arranged for students who were not able to write the supplementary examinations during scheduled times, as provided in the examinations timetable.

### **Pass requirements**

Refer also to G Regulations G.11.1(a) and G.12.2.2



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- a. In order to pass a module, a student must obtain an examination mark of at least 40% and a final mark of at least 50% except if stated otherwise in the study guide. A student passes a module with distinction if a final mark of at least 75% is obtained. The final mark is compiled from the semester/year mark and the examination mark.

**Please note:** In the School of Engineering, borderline cases (e.g. a mark of 49% or 74%) must be reconsidered by both the internal and external examiners, for determination of the possible merit of an upward adjustment of the mark. Marks may not be adjusted downwards, except when obvious marking and adding errors were detected. The pass mark is a minimum final mark of 50% and a student fails the module if a lower mark (e.g. 49%) was obtained.

- b. Calculation of the final mark: The semester/year mark must account for no less than 40% and no more than 60% of the final mark, with the exception of modules such as design and research projects and research reports/essays, as well as in modules where the development of general skills is the primary learning activity, where appropriate alternative norms are determined individually by schools or departments. The specific details and/or formula for the calculation of the final mark are set out in the study guide of each module. Also, a schedule listing this information (for all the modules presented in each school) will be compiled, for approval by the Dean.
- c. Calculation of the semester/year mark: The semester/year mark is compiled from formative assessment of learning activities such as assignments, presentations, practicals and group projects, as well as from class tests and semester tests. For each module the specific formula for the calculation of the semester/year mark is determined by the lecturer(s) responsible for the presentation of the module and the details are set out in the study guide. Also, a schedule listing this information for all the modules presented in each school will be compiled, for approval by the Dean.

Refer also to G Regulation G.11.1(b).

- d. In some modules specific requirements in respect of certain components of the semester/year mark may be set in order for a student to pass the module (for example that satisfactory performance in and attendance of practical classes are required). Thus, even if a pass mark is obtained in the module, a pass is not granted unless these requirements are met. For such modules these specific requirements are set out in the study guide. Also, a schedule containing this information (for all such modules presented in each school) will be compiled, for approval by the Dean.
- e. A student must comply with the subminimum requirements in subdivisions of certain modules. For such modules these specific requirements are set out in the study guide of the module. Also, a schedule containing this information (for all such modules presented in each school) will be compiled, for approval by the Dean.
- f. A student may be promoted (exempted from the examination) in certain modules in the School of Information Technology should a specified semester/year mark (minimum 65%) be obtained. For such modules these specific requirements are set out in the study guide of the module. Refer also to G Regulation G.10.3.

**Please note:** General Regulation G.10.3 is normally not applied by the School of Engineering and no promotion (exemption from the examination) is allowed in any module, except in special cases where permission of the Dean is required.

### **Dean's Merit List (Eng. 10.2)**

The Dean's Merit List will be published annually on the website of the Faculty and will contain the names of the students whose academic performance over the year has been excellent and deserves recognition. Letters of commendation will be sent to students who qualify for inclusion on the Dean's Merit List.

To be eligible for inclusion in the Dean's Merit List, a student in the School for Engineering must pass all the modules as prescribed in the curriculum of a specific year of study as published. A student registered for the first,

second or third year of the four-year programme must obtain a minimum weighted average of 75% and a student registered on the first, second, third or fourth year of the five year programme must obtain a minimum weighted average of 75%.

## **Additional regulations and information for the School of Engineering**

### **Selection**

A selection procedure takes place prior to admission to any programme in the School of Engineering. Restrictions may be placed on the number of students admitted to the School and/or its departments. Postgraduate selection takes place as stipulated in the respective departmental rules.

### **Renewal of registration (Eng.4)**

Should a student who is repeating a year of study, with the exception of first-year students, fail to obtain sufficient credits to be promoted to the subsequent year of study at the end of the year of repetition, he or she will forfeit his or her right to readmission. Students who forfeit the right to readmission, may apply in writing to the Admissions Committee for readmission to the Faculty. Provisions regarding promotion, including provisions for first-year students, appear in the regulations of the relevant fields of study.

### **Equivalent modules**

A BEng student may be permitted by the Dean, on recommendation of the relevant head of the department, to register for an equivalent module in an alternate semester, although the module is normally offered to the student's group in another semester, and providing that no timetable clashes occur.

### **Duration of examinations in undergraduate modules in the School of Engineering**

The duration of an examination in an 8-credit module will not exceed 90 minutes and in a 16-credit module will not exceed 180 minutes, except where special approval is granted by the Dean to exceed these limits. The duration of a supplementary examination or a special examination in all under-graduate modules will not exceed 90 minutes, except where special approval is granted by the Dean to exceed this limit. In the event of an aegrotat, the duration of the examination can be extended to a maximum period of 180 minutes, depending on an arrangement made between the lecturer and the student.

### **Exposure to the practice of engineering (Eng. 8)**

Engineering students are exposed in three ways to the practice of engineering during the course of their studies:

- Workshop practice – a module comprising a period at the end of the first year of study during which students are trained in workshop practice. Students in electrical, electronic and computer engineering attend the Introduction to Laboratory Measurements and Computer Simulations' module.
- Practical training – specific periods of work at firms during which experience is gained in the practice of engineering. Students may deviate from this stipulation only with the permission of the Dean.
- Excursions – study excursions arranged for students to visit various engineering firms and installations in order to obtain insight into the industry. This training is compulsory. Details of the modules regarding these aspects of training are explained in the sections of this publication which deal with the curricula and syllabi of the various programmes.

## **Additional regulations and information for the School for the Built Environment**

### **Selection**

Selection takes place prior to admission to the following programmes in the School for the Built Environment:

- All undergraduate programmes: A restricted number of students are admitted to all undergraduate programmes.
- Postgraduate programmes: A restricted number of students are admitted to the following taught programmes: BArchHons, BIntHons, BLArchHons, BScHons (Applied Science), BScHons Quantity Surveying, BScHons Construction Management, MArch(Prof), MInt(Prof), ML(Prof), MSc (Applied Science), MSc Quantity

Surveying, MSc Construction Management, MSc Real Estate and Master of Town and Regional Planning. Applications close on 31 October for South African students. Admission to the MSc and PhD programmes by research is subject to approval by the Head of Department and the Dean.

### **International students**

Applications close on 31 August for international students.

International students wanting to be considered for selection must have their qualifications audited and verified by the South African Qualifications Authority (SAQA). Those candidates wanting to register for professional postgraduate degree programmes for purposes of professional registration must further have their qualifications verified by the relevant registering council as to the equivalence of the registration category. All costs are for the direct account of the applicant. All documentation must accompany the application and be submitted before the closing date.

**Please Note:** Contact details for the various bodies are to be found on the relevant departmental web page.

### **Promotion requirements in the School for the Built Environment**

- a. Students whose academic progress is not acceptable can be suspended from further studies. Refer to the following important regulations: G Regulation G.3 and/or regulations as they appear for the applicable programmes.
- b. 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.
- c. A student who has been excluded from further studies may apply in writing to the admissions committee of the School for the Built Environment for readmission on or before 12 January.
- d. Should the student be readmitted by the admissions committee, strict conditions will be set which the student must comply with in order to proceed with studies.
- e. Should the student not be readmitted to further studies by the admissions committee, he/she will be informed in writing.
- f. Students who are not readmitted by the admissions committee have the right to appeal to the Senate Committee for Admission, Evaluation and Academic Support.
- g. Any decision taken by the Senate Committee for Admission, Evaluation and Academic Support is final.

### **Additional regulations and information for the School of Information Technology**

#### **Selection**

A selection procedure takes place prior to admission to the degree programmes in the School of Information Technology. The number of students admitted to the under-graduate programmes in the school may be limited. Postgraduate selection takes place in accordance with departmental policy.

#### **Academic literacy**

All first-year students in the School of Information Technology enroll for ALL 121, a specialised module in academic literacy for Information Technology. For students in the Four-year programmes, Language, life and study skills 1 and 2 are compulsory in both the first semester and second semester (LST 133 and LST 143).

#### **Requirements for specific modules (IT.3)**

A candidate who has:

- a. passed the Grade 12 examination in Mathematics with at least 50% will be admitted to WTW 134, WTW 115 and WTW 152, and 60% for WTW 114, WTW 126, WTW 158 and WTW 161 in Mathematics and to WST 111 etc. or obtained at least 3 (40-49%) for Mathematics in Grade 12, will be admitted to WTW 133 and WTW 143
- b. obtained at least 4 (50-59%) in Mathematics in the Grade 12 examination, or at least 50% in both Statistics 113, 123, will be admitted to Informatics 112; Economics 113, 123 and 120;
- c. obtained at least 5 (60-69%) in Mathematics, or obtained at least 4 (50 - 59%) in Mathematics and has



passed WTW 133 and WTW 143, will be admitted to Informatics 154 and 171.

- d. not passed at least four Computer science modules at second-year level, will not be permitted to register for the Computer science modules at third-year level, unless special permission has been granted by the Head of Department.

### **Minimum study period**

The minimum period of study for the degree is indicated at the relevant degree programme. Students registering for a three-year degree, must complete the degree in a maximum of five years. Students registering for a four-year degree, must complete the degree in a maximum of six years.



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## Undergraduate Degree

- BEng Chemical Engineering (12130002)**
- BEng Chemical Engineering ENGAGE (12136002)**
- BEng Civil Engineering (12130007)**
- BEng Civil Engineering ENGAGE (12136007)**
- BEng Computer Engineering (12130009)**
- BEng Computer Engineering ENGAGE (12136009)**
- BEng Electrical Engineering (12130003)**
- BEng Electrical Engineering ENGAGE (12136003)**
- BEng Electronic Engineering (12130008)**
- BEng Electronic Engineering ENGAGE (12136008)**
- BEng Industrial Engineering (12130001)**
- BEng Industrial Engineering ENGAGE (12136001)**
- BEng Mechanical Engineering (12130004)**
- BEng Mechanical Engineering ENGAGE (12136004)**
- BEng Metallurgical Engineering (12130005)**
- BEng Metallurgical Engineering ENGAGE (12136005)**
- BEng Mining Engineering (12130006)**
- BEng Mining Engineering (12130071)**
- BEng Mining Engineering ENGAGE (12136006)**
- BIS Information Science (12131012)**
- BIS Multimedia (12131013)**
- BIS Publishing (12131014)**
- BIT Information Technology (02130082)**





**BSc Architecture (12132018)**

**BSc Computer Science (12134001)**

**BSc Construction Management (12132025)**

**BSc Information and Knowledge Systems (12133213)**

**BSc Interior Architecture (12132020)**

**BSc Landscape Architecture (12132019)**

**BSc Quantity Surveying (12132023)**

**BSc Real Estate (12132024)**

**BTRP (12132026)**



## Honours

**BArchHons (12242005)**

**BEngHons Bioengineering (12240203)**

**BEngHons Chemical Engineering (12240022)**

**BEngHons Computer Engineering (12240214)**

**BEngHons Control Engineering (12240232)**

**BEngHons Electrical Engineering (12240032)**

**BEngHons Electronic Engineering (12240092)**

**BEngHons Environmental Engineering (12240222)**

**BEngHons Geotechnical Engineering (12240215)**

**BEngHons Industrial Engineering (12240012)**

**BEngHons Mechanical Engineering (12240052)**

**BEngHons Metallurgical Engineering (12240063)**

**BEngHons Microelectronic Engineering (12240192)**

**BEngHons Mining Engineering (12240072)**

**BEngHons Structural Engineering (12240122)**

**BEngHons Technology Management (12240252)**

**BEngHons Transportation Engineering (12240112)**

**BEngHons Water Resources Engineering (12240162)**

**BEngHons Water Utilisation Engineering (12240103)**

**BEngHons Welding Engineering (12240064)**

**BIArchHons (12242007)**

**BISHons Information Science (12240006)**

**BISHons Multimedia (12240007)**



**BISHons Publishing (12240008)**

**BLArchHons (12242008)**

**BScHons Applied Science Architecture (12242001)**

**BScHons Applied Science Metallurgy: Welding Technology (12243036)**

**BScHons Applied Science Chemical Technology (12243004)**

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

**BScHons Applied Science Geotechnics (12243005)**

**BScHons Applied Science Industrial Systems (12243002)**

**BScHons Applied Science Mechanics (12243006)**

**BScHons Applied Science Metallurgy (12243007)**

**BScHons Applied Science Mining (12243035)**

**BScHons Applied Science Structures (12243034)**

**BScHons Applied Science Transportation Planning (12243009)**

**BScHons Applied Science Water Resources (12243033)**

**BScHons Applied Science Water Utilisation (12243014)**

**BScHons Computer Science (12244001)**

**BScHons Construction Management (12242018)**

**BScHons Quantity Surveying (12242017)**

**BScHons Real Estate Retail Property (12242020)**

**BScHons Real Estate (12242019)**

**BScHons Technology Management (12241073)**



## Master's

**MArch (12252025)**

**MArch (Professional) (12252026)**

**MEng Bioengineering (12250203)**

**MEng Chemical Engineering (12250022)**

**MEng Computer Engineering (12250214)**

**MEng Control Engineering (12250232)**

**MEng Electrical Engineering (12250032)**

**MEng Electronic Engineering (12250094)**

**MEng Engineering Management (Coursework) (12250173)**

**MEng Environmental Engineering (12250222)**

**MEng Geotechnical Engineering (12250215)**

**MEng Industrial Engineering (12250012)**

**MEng Mechanical Engineering (12250052)**

**MEng Metallurgical Engineering (12250062)**

**MEng Microelectronic Engineering (12250192)**

**MEng Mining Engineering (12250072)**

**MEng Project Management (Coursework) (12250263)**

**MEng Software Engineering (12250204)**

**MEng Structural Engineering (12250122)**

**MEng Technology Management (12250253)**

**MEng Technology Management (Coursework) (12250254)**

**MEng Transportation Engineering (12250112)**

**MEng Water Resources Engineering (12250162)**



**MEng Water Utilisation Engineering (12250102)**

**MIntArch (12252027)**

**MIntArch (Professional) (12252028)**

**MIS Information Science (12254010)**

**MIS Library Science (12254009)**

**MIS Multimedia (12254011)**

**MIS Publishing (12254012)**

**MIT (12254014)**

**MIT Information Systems (12254013)**

**MLArch (12252029)**

**MLArch (Professional) (12252030)**

**MSc Applied Science Architecture (Coursework) (12252009)**

**MSc Applied Science Chemical Technology (12253062)**

**MSc Applied Science Control (12253061)**

**MSc Applied Science Electrical, Electronic and Computer Engineering (12253073)**

**MSc Applied Science Environmental Technology (12253067)**

**MSc Applied Science Geotechnics (12253063)**

**MSc Applied Science Industrial Systems (12253060)**

**MSc Applied Science Mechanics (12253064)**

**MSc Applied Science Metallurgy (12253065)**

**MSc Applied Science Mining (12253072)**

**MSc Applied Science Structures (12253071)**

**MSc Applied Science Transportation Planning (12253068)**

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**MSc Applied Science Water Resources (12253070)**

**MSc Applied Science Water Utilisation (12253069)**

**MSc Computer Science (12253074)**

**MSc Construction Management (12252032)**

**MSc Engineering Management (Coursework) (12251077)**

**MSc Project Management (Coursework) (12251078)**

**MSc Quantity Surveying (12252031)**

**MSc Real Estate Retail property (Coursework) (12252037)**

**MSc Real Estate (12252033)**

**MSc Real Estate (Coursework) (12252034)**

**MSc Technology Management (12251000)**

**MSc Technology Management (Coursework) (12251079)**

**MTRP (12252035)**

**MTRP (Coursework) (12252036)**



## Doctorate

**PhD Architecture (12262004)**

**PhD Biosystems (12263203)**

**PhD Chemical Engineering (12263012)**

**PhD Chemical Technology (12263142)**

**PhD Civil (12263222)**

**PhD Civil Engineering (12263072)**

**PhD Computer Engineering (12263104)**

**PhD Computer Science (12266001)**

**PhD Construction Management (12262018)**

**PhD Electric (12263152)**

**PhD Electrical Engineering (12263022)**

**PhD Electronic Engineering (12263082)**

**PhD Electronics (12263162)**

**PhD Engineering Management (12261072)**

**PhD Engineering Management (12263214)**

**PhD Industrial Engineering (12263002)**

**PhD Industrial Systems (12263132)**

**PhD Information Science (12264005)**

**PhD Information Systems (12264011)**

**PhD Information Technology (12264010)**

**PhD Interior Architecture (12262009)**

**PhD Landscape Architecture (12262005)**

**PhD Library Science (12264006)**



- PhD Mechanical Engineering (12263042)**
  - PhD Mechanics (12263172)**
  - PhD Metallurgical Engineering (12263052)**
  - PhD Metallurgy (12263182)**
  - PhD Mining (12263192)**
  - PhD Mining Engineering (12263062)**
  - PhD Project Management (12261092)**
  - PhD Project Management (12263216)**
  - PhD Publishing (12264007)**
  - PhD Quantity Surveying (12262017)**
  - PhD Real Estate (12262019)**
  - PhD Technology Management (12261082)**
  - PhD Technology Management (12263215)**
  - PhD Town and Regional Planning (12262023)**
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