UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

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Department of Civil and Biosystems Engineering

Post-graduate studies in:

- GEOTECHNICAL ENGINEERING
- STRUCTURAL ENGINEERING
- TRANSPORTATION ENGINEERING
- WATER RESOURCES ENGINEERING

Brochure for 2009

FOREWORD

Welcome to the post-graduate programme in the Department of Civil and Biosystems Engineering at the University of Pretoria. We are fortunate in having the critical mass of teaching staff and associates in the profession to be able to offer doctoral, masters and honours programmes in four engineering disciplines; namely Geotechnical, Structural, Transportation and Water Resources Engineering. We not only cater for civil engineering graduates, but past students have also included graduates from other disciplines (e.g., town planners, geographers, geologists, environmental scientists, hydrologists as well as BTech graduates from the Universities of Technology, former Technikons).

During the last ten years, over 450 post-graduate students have graduated through this department and are held in high esteem in the industry.

The post graduate degree programmes of the School of Engineering were redesigned in the course of 2003 to meet the requirements of the Department of Education and Higher Education and Training. All students who want to study towards a masters degree must first complete the honours degree. The South African Qualifications Authority (SAQA) credits for the honours degree are calculated separately from that of the masters degree. Credits cannot be transferred between the two degrees. Following the completion of the course work based honours degree, the masters degree can be done as a fully fledged research degree or a half split between research work and masters level course work. As from 2009 the honours degree modules taught in this Department will change from 16 credits to 24 credits, and the year programme has been changed accordingly.

The flexible learning mode used in the offering of these post-graduate modules includes block-week presentations of course work. This format enables short course presentation in these various areas of specialisation and can be taken for non-degree purposes for Continued Professional Development (CPD) points.

A number of our modules are already in digital format that provides you with greater flexibility in your learning. We are in the process of expanding the use of web- and CD-based education for your benefit and to stay at the cutting edge of education innovation.

*With all these study opportunities to increase your knowledge and skills in contributing to the growth of our country and continent I hope to see you at registration punctually at **08:00 on Saturday 24 January 2009**. If you are registering for the first time for post-graduate studies, please submit a completed application form before 31 October 2008. (Application forms available on the website www.up.ac.za, or from the Client Service Centre at csc@up.ac.za.*

Prof. Elsabe Kearsley PrEng
Head of Department

October 2008

1. OVERVIEW

1.1 The University and the Department of Civil and Biosystems Engineering

The University is located in Hillcrest Pretoria, 6 km from the CBD of Pretoria and 50 km from the Johannesburg International Airport (Figure 1). Within walking distance is the Hatfield commercial complex with its many shops, restaurants, entertainment venues and of course bookshops.

The University was established in 1908 as the Transvaal University College (that is why it is commonly referred to as TUKKIES). In October 1930, the independent University of Pretoria came into being. Since then it has grown to have a resident student population in excess of 50 000, the largest student population of any residential university in South Africa. This student population is made up of over 40 000 undergraduate students and nearly 10 000 post-graduate students.

The School of Engineering, which forms part of the Faculty of Engineering, Built Environment and Information Technology, has a student population of almost 5 000; of whom 1 200 are post-graduate students.

The Department of Civil and Biosystems Engineering, headed by Prof Elsabe Kearsley, has a teaching staff of 17 and in 2008 had a student population of over 1000 students of which more than 250 were post-graduate students.

During the last 10 years, the University of Pretoria has conferred over 320 undergraduate degrees and over 450 post-graduate degrees in the Department of Civil and Biosystems Engineering.

The department is housed in the Engineering 1 Building (often referred to as the Engineering Tower Building) and its location on the main Campus is shown in Figure 2.

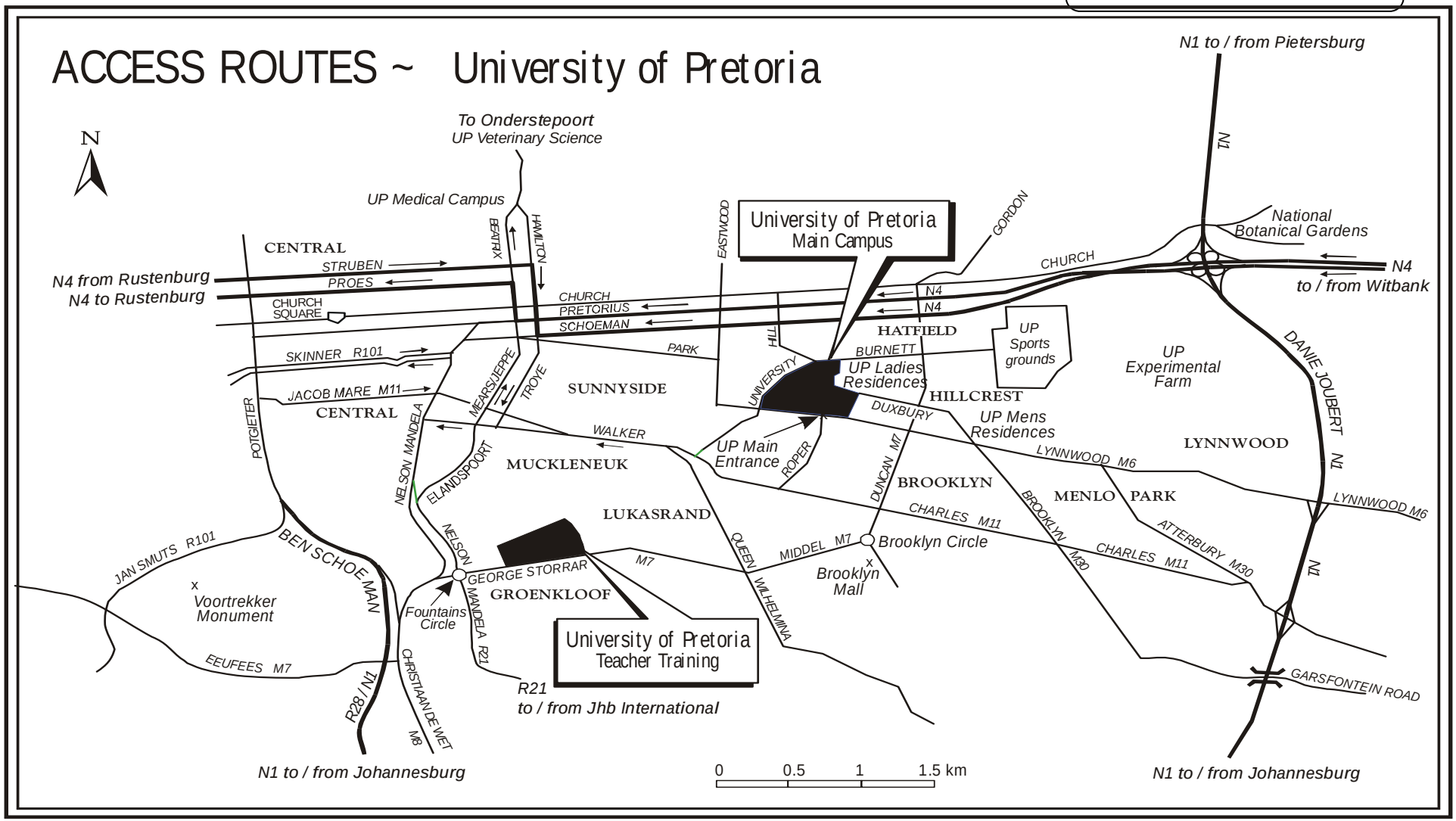

Figure 1: The location of the University of Pretoria

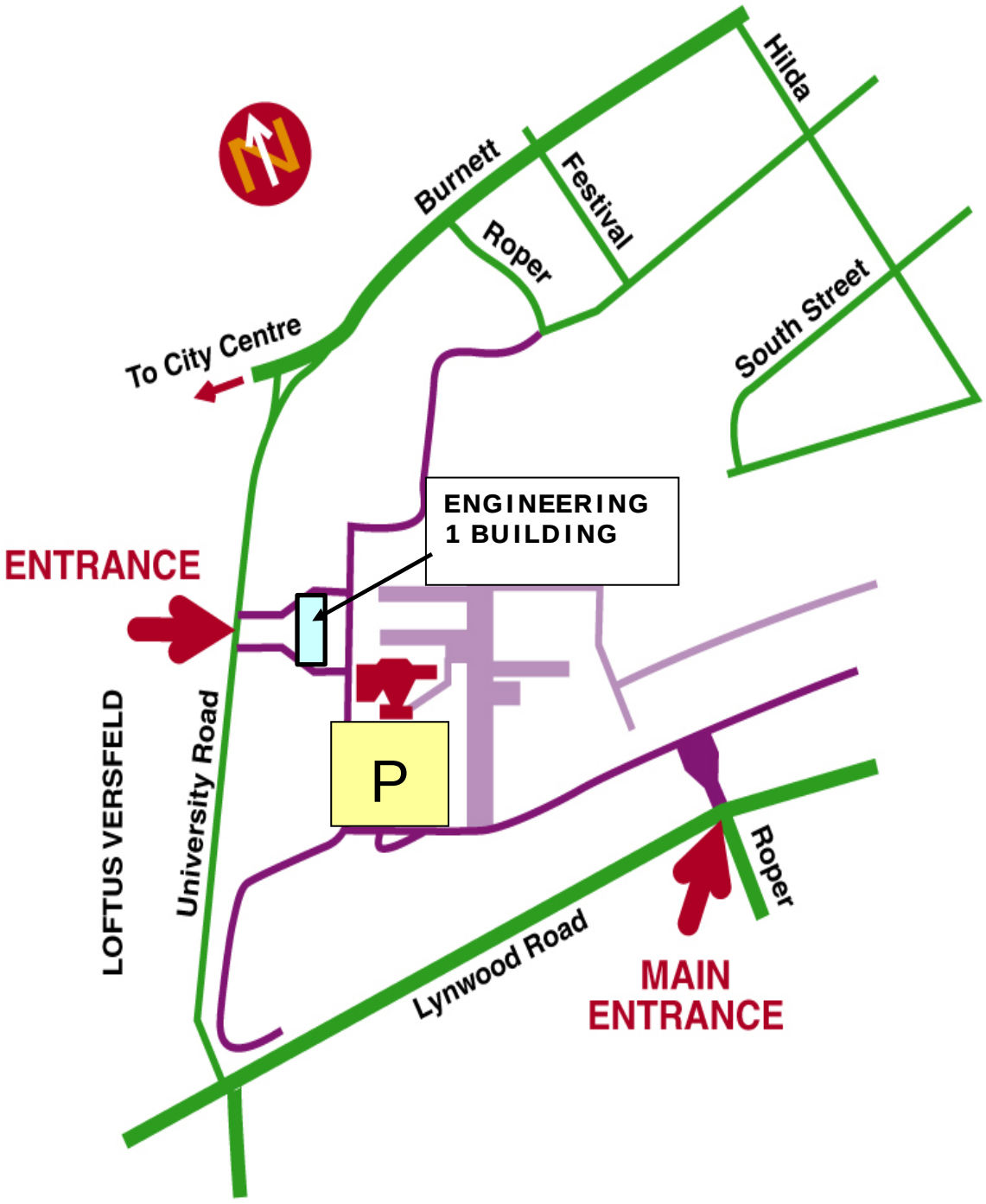

Figure 2: Map of the Main Campus of the University of Pretoria

1.2 THE DISCIPLINES

The Department of Civil and Biosystems Engineering offers post-graduate courses in four disciplines. These are shown below together with the name and contact details of the head of each discipline.

- **Head of Department of Civil and Biosystems Engineering**
  Prof E Kearsley
  Room 11-7 Eng 1; Phone: (012) 420 2429; fax: (012) 362 5218;
  e-mail: elsabe.kearsley@up.ac.za

- **Geotechnical Engineering**
  Prof G Heymann
  Room 11-20 Eng 1, Phone (012) 420 3627; fax: (012) 362 5218
  e-mail: gerhard.heymann@up.ac.za
  Prof E Rust
  Room 11-21 Eng. 1; Phone (012) 420 3286; fax: (012) 362 5218
  e-mail: eben.rust@up.ac.za

- **Structural Engineering**
  Prof BWJ Van Rensburg.
  Room 12-7 Eng. 1; Phone (012) 420 2439; fax: (012) 362 5218
  e-mail: ben.vanrensburg@up.ac.za

- **Transportation Engineering (SA Roads Board Chair)**
  Prof A T Visser.
  Room 11-26 Engineering 1; Phone (012) 420 3168; fax: (012) 362 5218
  e-mail: alex.visser@up.ac.za

- **Water Resources Engineering**
  Prof SJ van Vuuren
  Room 12-21 Engineering 1; Phone (012) 420 2438; fax: (012) 362 5218
  e-mail: fvuuren@eng.up.ac.za

1.3 THE DEGREE STRUCTURE

In each of the four disciplines of Civil Engineering, the University of Pretoria offers the following post-graduate degrees:

- BSc (Hons)(Applied Sciences) for students who have obtained a relevant 3-year University degree or a BTech degree from a former Technikon, or a 4-year degree not recognised by the Engineering Council of South Africa for PrEng registration.
- BEng (Hons) for students who have obtained an ECSA accredited university engineering degree.
- MSc (Applied Science) for students who have obtained a BSc (Hons) (App Science) degree.
- MEng for students who have obtained a BEng (Hons) or equivalent.
- PhD for students who have obtained a relevant Masters degree.
- DEng for persons that have shown excellence through academic publications.

A minimum of 128 SAQA credits needs to be obtained to complete the honours degree. The modules described later in detail per specialization area are mostly 24 SAQA credits per module or in some cases 16 or 32 SAQA credits. A further minimum 128 SAQA credits need to be completed to obtain the masters degree that follows the honours degree. No credits can be transferred from the honours degree to the masters degree as they are coded at separate levels and are mutually exclusive. The masters degree can be a full research (dissertation only) degree or half credits for modules and half credits for a project report. (See 1.4.5 for rules and regulations applicable to post-graduate studies).

1.4 REGISTRATION, FEES AND REGULATIONS

1.4.1 Registration Process

Applications from persons who are registering for post-graduate study for the first time should be submitted on the prescribed form obtainable from the Client Service Centre, at www.csc.up.ac.za or the University's web page www.up.ac.za/apply by **31 October 2008**.

The official enrolment form will be posted to candidates in December for completion at the special registration session in **Lecture hall 1-1, Engineering 1, on Saturday, 24 January 2009, promptly at 08:00.** If this is not possible, students should ensure that this form is completed, signed by the Head of Department and submitted to the Faculty Administration at least 4 weeks before a course commences, but by no later than **1 February 2009** (Supporting documents may be appended). Note that the appropriate Discipline Head must sign the application form of students enrolling for a degree in a speciality field. Study material for the modules offered during the first semester will generally be available at registration and students must obtain these from the head of discipline.

N.B. Students are no longer able to commence studies and register in mid-year.

It is most important to attend the registration session on **Saturday 24 January 2009**.
No registration will take place after 1 February 2009.

The listing of a module on the approved application form does not constitute a guarantee that the module will be offered. Students should note that even if a module is listed on the timetable, only those modules for which there is sufficient demand will be offered each year.

Students must also ascertain during registration whether the modules are being offered and that there are no clashes on the timetable.

First-time students for doctoral degrees may register at any time during the academic year.

1.4.2 Registration Fees

Please refer to the "Guide for Student Fees", which gives details regarding tuition fees and payment. The fees for 2009 will be announced towards the end of 2008.

A deposit or registration fee is payable at registration. It is, however, permissible to pay the remainder of the tuition fees in two instalments, namely a deposit at registration and one subsequent payment.

The applicable initial payment that is due before or during registration is as follows:

- Post-graduate students who are registering for the first time for a particular field of study will be required to pay an amount in the order of R2 800-00 towards their tuition fees before or during registration.
- Post-graduate students who are renewing their registration will be required to pay an amount in the order of R1 800-00 towards their tuition fees before or during registration.
- Post-graduate students who need to renew their registration in order to submit a dissertation/thesis for examination will, subject to the examination being completed before 30 March, be required to pay an administration levy of approximately R450-00. If the examination extends beyond 30 March the full re-registration amount, in the order of R1 800-00 must be paid.

1.4.3 Study fees

The exact fees payable for each module can be ascertained from the Student Administration Offices; but are in the order of R3 300 per 24 SAQA credits. An amount of approximately R2 000 is payable in the beginning of each year as a re-registration fee for doctoral degrees.

Fees for the Masters degree dissertation are approximately R17 000, for a PhD approximately R15 500 and for a DEng approximately R2 200. Consult the "Guide for Student fees for 2009".

The student's registration must be renewed annually until such time as the degree requirements have been complied with. Candidates who fail to renew their registration or who interrupt their studies are liable for the full tuition fees when the study is resumed. International students may be charged different fees, obtainable from the Administration.

1.4.4 Bursaries and grants

The University of Pretoria places a high premium on post-graduate study and accordingly supports full-time and part-time post-graduate students by making available bursaries and loans.

Further details may be obtained from Head (Study Financing) Tel (012) 420 5100 on:

- The value of bursaries available for full-time and part-time post-graduate students;
- The submission of applications;
- The basis of allocation;
- Loans;
- NRF post-graduate bursaries

From time to time student assistantships and junior lecturer positions also become available. Interested persons should contact Prof Elsabe Kearsley, Head of the Department of Civil and Biosystems Engineering Tel: (012) 420 2429; fax: (012) 362 5218;
e-mail: elsabe.kearsley@up.ac.za.

For possible financial assistance in any discipline please contact the relevant Head of the Discipline; or consult the last section of the discipline related sections in Chapter 2.

1.4.5 Rules and Regulations

For the rules and regulations relevant to post-graduate study, students should refer to:

- Regulations and Syllabi 2009.
- The Student Guide of the University of Pretoria.
- Timetable.
- General Regulations and Information 2009 Section B.

Irrespective of any comments contained in this brochure the Regulations and Syllabi 2009 and Student Guide will apply. These documents can be obtained from the Student Administration Offices.

Entry Requirements

Table 1 summarizes the entry requirements for the post-graduate degrees offered by the Department of Civil and Biosystems Engineering.

Table 1 : Entry requirements

POST-GRADUATE DEGREE	ENTRY REQUIREMENTS
BEng (Hons)	A BEng degree from the University of Pretoria or equivalent; with at least 60% average in the final year. If this requirement is not complied with, the candidate may apply after registering as a Professional Engineer. Exceptions to these requirements may be made.
BSc (Hons) (Applied Science)	An appropriate 3-year university degree or BTech degree, with at least 60% average in the final year. Applicants must apply to the Dean of the Faculty for admission to this study programme. The Dean of the Faculty may consider exceptions to these requirements. All new applicants wishing to study in 2009 or thereafter will be required to submit the Graduate Record Examination (GRE) that evaluates the basic engineering and mathematical principles, and the Test of English as a Foreign Language (TOEFL) with their applications. Applicants must use the **General GRE** option for evaluation. Both evaluations are taken by the same organisation and the information is available on www.gre.org and www.toefl.org. Evaluations are conducted on a weekly basis at the examination centres in Johannesburg and Cape Town, and at many other centres around the world. Applicants can select at which venue and on which date they wish to take the evaluation, and they must request that results be submitted to the University. There is significant support on the web through training exercises and mock examinations.
MEng	A BEng(Hons) degree from the University of Pretoria or equivalent; with at least 65% average. Exceptions to these requirements will be considered by the Head of Department and the Dean.
MSc (Applied Science)	A BSc(Hons) (Applied Science) degree from the Department of Civil and Biosystems Engineering of the University of Pretoria or equivalent; with at least 65% average. An entrance examination may be required.
PhD or PhD(Eng)	A master's degree from the University of Pretoria or equivalent and be a mature professional, preferably with professional registration. Exceptions to these requirements will be considered by the Head of Department and the Dean. The PhD(Eng) degree requires a Masters degree in engineering.
DEng	This degree is awarded on the basis of international renown for excellence in academic publications. Candidates must be in possession of a PhD degree.

1.4.6. Doctoral Studies

Admission requirements for PhD (Eng), PhD, PhD (Applied Sciences) and D(Eng)
An appropriate master's degree is required for admission to the PhD programme. An engineering master's degree is required for admission to the PhD (Eng) programme, an MSc for the PhD programme and an MSc (Applied Science) for the PhD (Applied Science) programme. (Refer to the General Regulations G.45 - G.61 part 1). The academic status of degrees obtained at other universities needs to be clarified with the Student Administration Offices.

Degree requirements
The PhD-degree is awarded on the basis of a thesis and an examination in the field of study, although no specialty designation e.g. Transportation, etc. is indicated on the degree certificate.

It is required of a candidate to present proof by means of a thesis of INDEPENDENT ADVANCED ORIGINAL RESEARCH and/or CREATIVE work, which makes a SUBSTANTIAL CONTRIBUTION TO THE KNOWLEDGE OF ENGINEERING SCIENCE and/or PRACTICE.

The thesis, or part thereof, MUST be publishable and the candidate must submit at least two draft articles for publication in a recognized INTERNATIONAL professional journal, prior to or concurrently with the submission of the thesis.

The DEng-degree is awarded, on the basis of publications based on eminent and extensive research work, to researchers who enjoy international recognition. (Refer to General Regulations G.56, General Information and Regulations Eng.27 of Part I of the Rules and Regulations, Faculty of Engineering, Built Environment and Information Technology).

1.4.7. Study arrangements

Modules are offered either as block week modules, evening class modules or full-day modules. Any of the modules can be taken as continuing education courses. Students would register for non-degree purposes and 6 hours of lectures are equivalent to one ECSA CPD day.

Block week modules
Modules are offered as 2 or 3 lectures per day (depending on the module credit) over two or more periods in each semester. Students will also be required to complete assignments and examinations.

Study material for block week modules is available in advance and students should ensure that they obtain this material, as admission to the module may be refused if inadequate preparation has been made for the first lectures. The official arrangements are as follows:

- **For modules offered during the 1st semester** the material is generally available during registration in January. (Students are requested to contact the Head of Discipline for this material that must be collected at least 4 weeks before the course and no later than 1 February 2009).

- **For modules offered during the 2nd semester** the material is available during the examination week in June/July. (Students are requested to contact the Head of Discipline for this material, which must be collected before 30 June 2009).

Evening class modules

Evening class modules comprise the following:

- Evening lectures throughout the academic year or semester, as the case may be.
- Reading, study and project assignments as well as tests.
- An examination at the end of the semester or year, as the case may be.

Full day modules/Short course modules

These modules are presented over a number of days. The number of days depends on the module credits. The workload is as for the other modules; i.e. lectures, assignments and examinations.

Workload for module credits

Each module is assigned a number of SAQA credits. Approximately 10 hours of study are required per SAQA credit.

A Master's project report will entail about 600 hours of study, and a Master's dissertation about 1 200 hours of research and study.

Maximum number of credits for which students may enrol.

Full-time honours or masters students shall not enrol for more than 128 SAQA credits per year, distributed in relation to the examination period, without the approval of the Head of Department. Full-time students shall submit a complete work programme to the Head of Department via the relevant Head of Discipline. These students will also be expected to assist in general research and/or academic activities.

Part-time honours students shall not enrol for more than 72 SAQA credits per year, distributed in relation to the examination period, without the written approval of the Head of Department. Part-time masters students shall not enrol for more than 72 SAQA credits per semester without the written approval of the Head of the Department.

Examinations

Examinations in post-graduate modules generally take place during June/July and November. Enrolment for examinations coincides with enrolment for modules. The exact dates will be provided by the lecturer of each module and are posted on the post-graduate notice board in the basement of Engineering 1.

Pass requirements
The pass requirement is a final mark of 50% for each module. In those modules where a semester grade is given, a minimum mark of 40% is required in the examination and a final mark of 50% is required.

No supplementary examinations or reassessments are allowed in respect of any post-graduate modules. Should a student fail a module, no exemption from attendance of lectures will be considered when the module is repeated. A post-graduate module may only be repeated once.

Module changes
Should a student decide during the academic year to discontinue certain modules for which he/she enrolled, the student is required to complete and submit the relevant form to the Student Administration Offices. (Mrs E Mofulatsi Tel: (012) 420 2142 or e-mail: Eunice.mofulatsi@up.ac.za). A student should confirm closing dates for module cancellations as late cancellation will result in payment of full fees.

To discontinue studies, a student should contact the Client Service Centre (csc@up.ac.za).

A student wishing to change modules after registration must complete the official "Change of Subject" form, which must be approved by the Head of the Discipline and Head of Department, and submitted to the Student Administration. The closing dates for these changes are shown in the TUKS CALENDAR. (Available from the Student Administration Offices or on the website at http://www.up.ac.za/calendars/calendarget.html).

In case of change of address, the student is required to inform the Head of Department as well as the Student Administration immediately, and modify the information on students-on-line (SOS).

Transitional measures
Any module passed more than 7 years ago or where the syllabus has changed, will not be taken into account when determining the credits passed for a particular degree.

Up to 2008 the requirement was that a student typically completed 8 modules of 16 credits each to give a total of 128 SAQA credits for an Honours degree. From 2009 a minimum of 128 SAQA credits is required, and Table 2 gives the status of a student at the end of 2008, and the subsequent requirements in terms of the new 24 credit modules.

Basic courses: In 2008 the requirement was that Applied Science students completed 4 basic courses, or 64 SAQA credits. If a student has not completed 64 credits by end 2008, then he/she will be required to do the outstanding credits in 2009. For example, in Transport Technology, two current modules are combined into one 24-credit module. If students require doing one of the two, then in 2009 they would do the new combined module.

Co-operation with other universities

With a view to eliminating unnecessary overlap and duplication, active co-operation between universities at post-graduate level is being pursued:

a) Post-graduate modules passed at another university may be recognised in terms of the stipulations of General Regulation G.23 and G.37.
b) Students enrolled at one university may be permitted to take limited modules at another university.

Students affected by, or interested in such arrangements may contact the Head of Department for further details.

Table 2. Required courses after 2008 to complete programme

Number of courses completed by end 2008	SAQA credits completed by end 2008	Number of 24 module courses needed from 2009
1	16	6
2	32	4
3	48	4
4	64	3
5	80	2
6	96	2
7	112	1

1.4.8. Important Dates

Closing date for **application for admission** for study in the following year by students registering for the first time as post-graduate students is 31 October 2008.

CLOSING DATES FOR REGISTRATION

First semester	1 February 2009 or at least 4 weeks before the course date (except for the January Water Engineering course).

BLOCK WEEKS FOR MODULES OFFERED BY DEPT OF CIVIL ENGINEERING

First semester	2-6 March and 20-24 April 2009
1st Semester examinations	20-24 July 2009
Second semester	17-21 August and 5-9 October 2009
2nd Semester examinations	2-6 November 2009

DATES OF MODULES OUTSIDE OF THE BLOCK WEEKS

First semester:

Basic Statistical Methods SHC 797	18 February, 24/5 March, 27 May 2009
Basic Transport'n & Traffic Engng SVV 789	19/20 February, 26/7 March, 28/9 May 2009
Concrete Technology SGC 794	To be confirmed by lecturer
Environmental Management CEM 780	Dates to be confirmed
Environmental Paradigms ENV 810	Dates to be confirmed
Project Management IPK 780	Dates to be confirmed

Urban Development Management SOB 800	Dates to be confirmed
Water Engineering Subjects	
Pump Systems SHW 785	26 - 28 January 2009
Hydraulic Design SHC 783	2 - 4 February 2009

Second semester:

Basic Pavement Materials and Design SGM 786	22 - 24 July 2009
Environmental Analysis Assessment & Modelling ENV 812	Dates to be confirmed
Water Engineering Subjects	
Basic Fundamental Hydraulics SHW 787	29 - 31 July 2009
Water Resources Analysis and Management SHC 796	3 - 5 August 2009

BLOCK WEEKS FOR MODULES OFFERED BY STRUCTURAL ENGINEERING

First semester	2-6 March and 20-24 April and 25-29 May 2009
1st Semester examinations	22-26 June 2009
Second semester	17-21 August and 5-9 October and 2-6 November 2009
2nd Semester examinations	30 November – 4 December 2009

BLOCK WEEKS FOR MODULES OFFERED BY OTHER DEPARTMENTS

Block weeks and examination dates to be obtained from the relevant department.

2. POST GRADUATE PROGRAMMES

This section briefly describes each of the disciplines within the Department of Civil and Biosystems Engineering in which post-graduate programmes are offered and the modules that make up the post-graduate programmes.

GEOTECHNICAL ENGINEERING

2.2.1 The Discipline

Geotechnical Engineering is a specialist field of research and application within the larger framework of Civil Engineering. All engineering aspects of soil and rock fall within this discipline. The courses presented cover the highly specialized theoretical Soil Mechanics and Geotechnical Engineering as well as the specialist fields of laboratory and in situ testing.

The discipline is staffed by:
Prof E Rust Tel: (012) 420 3286; Fax: (012) 362 5218; e-mail: eben.rust@up.ac.za
Prof G Heymann Tel: (012) 4203627; Fax: (012) 362 5218; e-mail gerhard.heymann@up.ac.za

Specialists in the field of geotechnical engineering that assist the discipline include:
Prof GA Jones and Prof CRI Clayton (Southhampton).

At present the research in the discipline is focused on advanced geotechnical laboratory testing, Geotechnical, geo-environmental and in-situ testing.

The entry requirements for the degrees that are obtainable in this discipline are described in Section 1.4.5. The descriptions of the curricula for each of the modules are outlined in Annexure A.

2.2.2 BEng (Hons)(Geotechnical Engineering)(12240212)

Students who have obtained a BEng degree or equivalent may apply for admission to this post-graduate programme.
To obtain this degree, students will be required to obtain a minimum 128 SAQA credits:

Core Modules:	**Code**	**Credits**
Geotechnical Design Special 795	SGC 795	24
Geotechnical Laboratory Testing 785	SGS 785	24
In-Situ Soil Testing and Monitoring 786	SGS 786	24
Soil Mechanics Special 784	SGM 784	24
Statistical Methods 791	SHC 791	24
Electives:		
Engineering Geology 703	IGL 703	16

2.2.3 BSc(Hons)(Applied Science) (12243019)

Specialization in **Geotechnics**

Students who have obtained a relevant three-year university degree or BTech degree may apply for admission to this post-graduate programme. As for the other Honours degrees, a minimum 128 SAQA credits are required. The modules are as follows:

Module name	Code	Credits
Basic Soil Mechanics 785	SGM 785	24
Geotechnical Design Special 795	SGC 795	24
Geotechnical Laboratory Testing 785	SGS 785	24
In-Situ Soil Testing and Monitoring 786	SGS 786	24
Soil Mechanics Special 784	SGM 784	24
Engineering Geology 703	IGL 703	16

Students must first successfully complete SGM 785 ‘Basic Soil Mechanics’ before enrolment for the other geotechnical modules will be approved.

2.2.4 MEng (Geotechnical Engineering)(12250212)

A student who has obtained a BEng (Hons) degree or equivalent may apply for admission to this post-graduate programme. A total of 128 SAQA credits must be obtained in the following two ways:

Module name	Code	Credits
Dissertation 890	SGI 890	128
or		
Project 896	SGT 896	64
Advanced Geotechnical Engineering 880	SGS 880	32
Computer Applications for Civil Engineers 880	SHC 880	32

2.2.5 MSc (Applied Sciences) (12253019)

Specialization in **Geotechnics**

A total of 128 SAQA credits must be obtained. A student who has obtained a BSc (Hons) (Applied Science) degree may apply for admission to this post-graduate programme and obtain the degree in one of the following two ways:

Module name	Code	Credits
Dissertation 890	SST 890	128
or		
Project 896	SST 896	64
Advanced Geotechnical Engineering 800	SGS 880	32
Computer Applications for Civil Engineers 880	SHC 880	32

2.2.6 Doctoral Studies

Information on doctoral degrees is given in Section 1.4.6.

2.3 STRUCTURAL ENGINEERING

2.3.1 The Discipline

A wide spectrum of modules is presented, including more analytical subjects such as structural analysis and structural mechanics as well as design courses in concrete, pre-stressed concrete, steel and timber.

The discipline is staffed by:

Prof B.W.J. van Rensburg Tel: (012) 420 2439; e-mail: ben.vanrensburg@up.ac.za
Prof W.M.G. Burdzik Tel: (012) 420 2746; e-mail: walter.burdzik@up.ac.za
Prof N.W. Dekker Tel: (012) 420 2179; e-mail: nick.dekker@up.ac.za
Prof C.P. Roth Tel: (012) 420 2185; e-mail: chris.roth@up.ac.za
Dr E. Chaparanganda Tel: (012) 420 2175; e-mail: ellijah.chaparanganda@up.ac.za

Specialists in the field of Structural Engineering that assist the discipline include:

Dr J Robberts Tel: (012) 420 2196; Fax: (012) 362 5218; e-mail: john.robberts@up.ac.za
Prof E P J van Vuuren Tel: (012) 420 2181; e-mail: evanvuuren@hotmail.com

At present the research of the discipline is focused on:

- Advanced structural analysis
- Reinforced and prestressed concrete
- Structural steel
- Structural timber

Recent examples of research output include papers in recognised local and international journals and presentations at international conferences.

The requirements for the degrees that are obtainable in this discipline are described in the following sections. The descriptions of the curricula for each of the modules are outlined in Annexure A.

2.3.2 BEng (Hons)(Structural Engineering) (12240121)

Students who have obtained an engineering degree or equivalent may apply for admission to this post-graduate programme.

To obtain this degree, students will be required to obtain a minimum of 128 SAQA credits from the following modules:

At least 96 credits from the following:

Module name	**Code**	**Credits**
Prestressed Concrete Design 791	SIN 791	24
Reinforced Concrete Design 778	SIN 778	24
Steel Design 776	SIN 776	24
Structural Analysis 790	SIN 790	24
Structural Mechanics 777	SIN 777	24
Timber Design 779	SIN 779	24

***and** the remainder of the credits from the following:*

Civil Engineering Special 792	SGC 792	24
Concrete Technology 794	SGC 794	24
Geotechnical Design Special 795	SGC 795	24
Hydraulic Design 793	SHC 793	24
Statistical Methods 791	SHC 791	24

An approved module from the Department of Mathematics and Applied Mathematics
An approved module from the Department of Mechanical Engineering.

2.3.3 BSc (Hons)(Applied Science) (12243031)

Specialization in **Structures**

Students who have obtained a relevant three-year university degree or BTech degree may apply for admission to this post-graduate programme. As for the other Honours degrees, a minimum 128 SAQA credits are required. The modules to select from are as follows:

Module Name	**Code**	**Credits**
Basic Concrete Structures 792	SIC 792	24
Basic Steel Structures 791	SIC 791	24
Basic Structural Analysis 790	SIC 790	24

and the remainder of the credits chosen from the modules prescribed for the BEng(Hons)(Structural Engineering) programme, as approved by the Head of the Department, and after completion of the appropriate modules from the list above.

2.3.4 MEng (Structural Engineering) (12250121)

A student who has obtained a BEng (Hons) degree or equivalent may apply for admission to this post-graduate programme. A total of 128 SAQA credits must be obtained in the following two ways:

Module Name	**Code**	**Credits**
Dissertation: Structural Engineering 890	SIN 890	128
or		
Project 896	SIN 896	64
and 64 credits from the following:		
Advanced Structural Analysis 887	SIN 887	32
Advanced Structural Design 886	SIN 886	32
Computer Applications for Civil Engineers 880	SHC 880	32

An approved module from the Department of Mechanical Engineering

2.3.5 MSc (Applied Science) (12253036)

Specialization in **Structural Technology**

A total of 128 SAQA credits must be obtained. A student who has obtained a BSc (Hons) (Applied Science) degree may apply for admission to this post-graduate programme and obtain the degree in one of the following two ways:

Module Name	**Code**	**Credits**
Dissertation 890	SST 890	128
or		

Project 896	SST 896	64
and *64 credits from the following:*		
Advanced Structural Analysis 887	SIN 887	32
Advanced Structural Design 886	SIN 886	32
Computer Applications for Civil Engineers 880	SHC 880	32
An approved module from the Department of Mechanical Engineering		

2.3.6 Doctoral Studies

Information on doctoral degrees is given in Section 1.4.6.

2.4 TRANSPORTATION ENGINEERING

2.4.1 The Discipline

The economic and social well-being of our country is significantly influenced by the efficient movement of persons, goods and services. This is the purpose of this discipline. To this end, the discipline includes the study of pavement engineering, geometric design, traffic engineering, traffic safety and transportation planning.

The discipline is headed by:
Prof A T Visser Tel: (012) 420 3168; Fax (012) 362 5218; e-mail alex.visser@up.ac.za
He is supported by:
Prof C Venter Tel: (012) 420 2184; Fax (012) 362 5218; e-mail christo.venter@up.ac.za

Specialists in the field of transportation engineering that assist the discipline include
Dr P Pretorius, Prof M de Beer, Dr H Ribbens and Dr W Steyn.

At present the research of the discipline is focused on public transport, land use and transport modelling, traffic safety and pavement research. Recent examples of this research include:

- Gender and location aspects of transport use by low-income households.
- Land use allocation models.
- Design and maintenance of heavy duty haul roads.
- Labour intensive techniques for pavement construction.
- Developing the theory for impact compaction.
- Evaluating the new South African hot-mix asphalt design method for various materials.

The requirements for the degrees that are obtainable in this discipline are described in the following sections. The descriptions of the curricula for each of the modules are outlined in Annexure A.

2.4.2 BEng (Hons)(Transportation Engineering) (12240111)

Students who have obtained an engineering degree or equivalent may apply for admission to this post-graduate programme.

A minimum of 128 SAQA Credits must be obtained from the following:

Core Modules:	**Code**	**Credits**
Statistical Methods 791	SHC 791	24
Transportation Planning 789	SVC 789	24
Electives:		
Asphalt Technology 798	SGC 798	24
Civil Engineering Special 792	SVC 792	24
Concrete Technology 794	SGC 794	24
Geometric Design and Safety 791	SVV 791	24
Maintenance Special 780	SVC 780	24
Multimodal Transport 788	SVV 788	24
Pavement Design 793	SGC 793	24
Road Rehabilitation Technology 797	SGC 797	24

Stabilized Materials and Compaction 796	SGC 796	24
Traffic Engineering 792	SVC 792	24
Transportation Special 791	SVC 791	24
Transportation Studies 790	SVC 790	24

2.4.3 BSc (Hons) (Applied Science) (12243028)

Specialization in **Transportation Planning**

Students who have obtained a relevant three-year university degree or B Tech degree may apply for admission to this post-graduate programme. As for the other Honours degrees, a minimum of 128 SAQA credits are required from the following:

Core Modules	**Code**	**Credits**
Basic Pavement Materials and Design 786	SGM 786	24
Basic Statistical Methods 797	SHC 797	24
Basic Transport and Traffic Engineering 789	SVV 789	24
Transportation Planning 789	SVC 789	24

and the remainder of the credits chosen from the modules prescribed for the BEng(Hons)(Transportation Engineering) programme, as approved by the Head of the Department, and after completion of the appropriate modules from the list above. The Basic courses must be taken before proceeding to the other modules.

2.4.4 MEng (Transportation Engineering) (12250111)

A student who has obtained a BEng (Hons) degree or equivalent may apply for admission to this post-graduate programme. A total of 128 SAQA credits must be obtained in the following two ways:

Module Name	**Code**	**Credits**
Dissertation 890	SVI 890	128
or		
Project 896	SVI 896	64
and *64 credits from the following:*		
Advanced Transportation I 882	SVV 882	32
Advanced Transportation II 883	SVV 883	32
Computer Applications for Civil Engineers 880	SHC 880	32

2.4.5 MSc (Applied Science) (12253028)

Specialization in **Transportation Planning**

Students who have obtained a BSc (Hons) (Applied Science) (Transportation Technology) degree or equivalent may apply for admission to this post-graduate programme. A total of 128 SAQA credits must be obtained in one of the following two ways:

Module Name	**Code**	**Credits**
Dissertation 890	SST 890	128
or		
Project 896	SST 896	64
and *64 credits from the following:*		
Advanced Transportation I 882	SVV 882	32
Advanced Transportation II 883	SVV 883	32
Computer Applications for Civil Engineers 880	SHC 880	32

2.4.6 Doctoral studies

Information on doctoral degrees is given in Section 1.4.6.

2.4.7 Financial support for studies and research

The Department of Transport, through the Centre for Transport Development at the University of Pretoria, provides substantial support for full-time post-graduate studies.
Enquires: Prof Alex Visser Tel: (012) 420 3168; Fax: (012) 362 5218.
e-mail: alex.visser@up.ac.za

Other sources of financial support include:

- AUTOMOBILE ASSOCIATION OF SOUTH AFRICA Bursaries for tuition fees are awarded annually. The closing date for applications is 30 April in the preceding year. For details and application forms, write to The Director-General, Automobile Association of South Africa, P O Box 596, JOHANNESBURG, 2000)

- THE SOUTH AFRICAN ROAD FEDERATION A bursary is awarded annually for post-graduate study at a South African university. The closing date for applications is 31 August for the following year of study. Application forms are available from Ms Angie Gouws, South African Road Federation, P O Box 31577, BRAAMFONTEIN, 2017. Tel: (011) 403 5603; Fax: (011) 403 7736; email: sarfuse1@acenet.co.za

2.5 URBAN ENGINEERING

This field of specialisation has been discontinued, and students who need to complete the programme must make contact with the Head of the Department for directives regarding completion of the programme.

2.6 WATER RESOURCES ENGINEERING

2.6.1 The Discipline

Water Resources Engineering encompasses various elements of the natural and man-made water cycle. Civil engineers' input in creating sustainable development that requires safe water supply to all consumers and protect the natural resources is based on an understanding of the natural hydrological cycle, physical principles and the effect of human interference with these fields.

The subjects that are presented are aimed at broadening the understanding of different aspects of hydrological and hydraulic phenomena and the application thereof in the design of pipelines, pump stations, open channels, hydraulic structures and the assessment of the yield from surface water resources. The lecture material is presented in such a format that it enhances the skills of the student to undertake real problems.

The discipline is headed by:
Prof SJ van Vuuren Tel: (012) 420 2438; Fax (012) 362 5218
e-mail: fanie.vanvuuren@up.ac.za
He is supported by:
Mr M van Dijk Tel: (012) 420 3176; Fax (012) 362 5218; e-mail: marco.vandijk@up.ac.za
Mr A de Klerk Tel (012) 420 5484; Fax (012) 362 5218; e-mail: anton.deklerk@up.ac.za

The research focus of the group is on the evaluation of the prevention of cavitation in control valves, operating conditions on the roughness in pipelines and the application of Genetic Algorithms in the optimisation of water systems.

Recent publications and research projects include:

- *"Quantifying the influence of air on the capacity of large diameter, water pipelines and developing provisional guidelines for effective de-aeration" Volume 1 and 2. WRC Report 1177/1/04 and 1177/2/04.*
- *"Application of Genetic Algorithms – Determination of the optimal pipe diameters". Paper published (May 2002) S A Water Bulletin.*
- *"Factors influencing the friction loss in pipelines and the relationship between water quality, operating conditions and the performance of liner systems". WRC Report TT278/06*
- *"Grouted lining systems for the renovating of old steel pipelines and design of new pipelines". WRC K5/1448.*
- *"Inverse transients to determine deficiencies in pipelines". K5/1721*
- *"Influence of catchment development on peak urban run-off". K5/1752*
- *"Development of a SA guide for the design and operation of waterborne sewerage systems". K5/1744*
- *"Determination of the change in hydraulic capacity in pipelines". K5/1820*

Focus areas applicable for a masters' degree, dissertation or project report.

- Cavitation prevention in control valves.

- Water distribution system optimization.
- Reduction in evaporation from reservoirs.
- Inverse transients to determine deficiencies in pipelines.
- Influence of catchment development on urban run-off.

The requirements for the degrees that are obtainable in this discipline are described in the following sections. The descriptions of the curricula for each of the modules are outlined in Annexure A.

Most of the Water Resources Engineering courses will be presented as short courses open to persons from industry for non-degree purposes. Students enrolled for a degree will be required to submit assignments and write an exam at the end of the semester.

A feedback session will be organized in the official second block week in each semester, where students can discuss any problems with the lecturer.

2.6.2 BEng (Hons)(Water Resources Engineering) (12240161)

Students who have obtained an engineering degree or equivalent may apply for admission to this post-graduate programme.

To obtain this degree, students will be required to obtain a minimum of 128 SAQA credits of the following modules: *At least 96 credits from the following core modules:*

Core Module	**Code**	**Credits**
Flood Hydrology 792	SHC 792	24
Free Surface Flow 794	SHC 794	24
Hydraulic Design 793	SHC 793	24
Pipe Flow 795	SHC 795	24
Pump Systems 785	SHW 785	24
Statistical Methods 791	SHC 791	24
Water Resource Analysis and Management 796	SHC 796	24
and *the remainder of the credits from the following:*		
Civil Engineering Special 792	SGC 792	24
Concrete Technology 794	SGC 794	24
Geotechnical Design Special 795	SGC 795	24
Maintenance Special 780	SVC 780	24
Pavement Design 793	SGC 793	24
Reinforced Concrete Design 778	SIN 778	24

Modules offered by the Department of Chemical Engineering (See paragraph 2.9)

2.6.3 BSc (Hons) (Applied Science) (12243030)

Specialization in **Water Resources**

Students who have obtained a relevant three-year university degree or BTech degree may apply for admission to this post-graduate programme. A minimum of 128 SAQA credits need to be obtained from the following modules:

Core Modules (Compulsory 48 credits)	**Code**	**Credits**
Basic Fundamental Hydraulics 787	SHW 787	24
Basic Applied Hydraulics 786	SHW 786	24
and *24 credits from the following:*		
Basic Concrete Structures 792	SIC 792	24
Basic Pavement Materials and Design 786	SGM 786	24
Basic Soil Mechanics 785	SGM 785	24
Basic Statistical Methods 797	SHC 797	24
Basic Steel Structures 791	SIC 791	24
Basic Structural Analysis 790	SIC 790	24
Basic Transport and Traffic Engineering 789	SVV 789	24

and the remainder of the credits chosen from the modules prescribed for the BEng(Hons)(Water Resource Engineering) programme paragraph 2.6.2 (Core Modules) as approved by the Head of the Department, and after completion of the appropriate modules from the list above.

2.6.4 MEng (Water Resources Engineering) (12250161)

A student who has obtained a BEng (Hons) degree or equivalent may apply for admission to this post-graduate programme. A total of 128 SAQA credits need to be obtained in one of the following two ways (option 1 or option 2).

Module name	**Code**	**Credits**
Option 1		
Dissertation: Water Resources Engineering 890	WBK 890	128
or		
Option 2		
Project 890	SSC 890	64
and *64 credits from the following:*		
Computer Applications for Civil Engineers 880	SHC 880	32
Advanced Hydraulics 885	SHC 885	32
Advanced Hydrology 886	SHC 886	32

2.6.5 MSc (Applied Science) (12253031)

Specialization in **Water Resources**

Students who have obtained a BSc (Hons)(Applied Science) degree or equivalent may apply for admission to this post-graduate programme. A total of 128 SAQA credits must be obtained in one of the following two ways:

Module Name	**Code**	**Credits**
Option 1		
Dissertation 890	SST 890	128
or		
Option 2		
Project 896	SST 896	64
and *specialization in Water Resources*		
64 credits from the following:		
Computer Applications for Civil Engineers 880	SHC 880	32
Advanced Hydraulics 885	SHC 885	32
Advanced Hydrology 886	SHC 886	32

2.6.6 Doctoral Studies

Information on doctoral degrees is given in Section 1.4.6.

2.7 SPECIALIST STUDY AREAS

2.7.1 Concrete materials

As design techniques become more sophisticated safety margins are reduced and the actual behaviour of the construction materials over the design life of infrastructure becomes more important. The *Concrete Materials* group aims to improve the understanding of the short and long term behaviour of cementitious materials through teaching and research.

The concrete materials group currently presents a post graduate course:

- Concrete Technology (SGC794)

Researchers in the concrete materials group include Prof Elsabe Kearsley, Mr Derek Mostert (Concrete Technologist) and full time post-graduate research students. From time to time funding is available to support students who are interested in doing research masters or doctorates.

Some of our recent research topics include investigations into:

- The use of waste materials in concrete.
- Alternative sources of fly ash.
- Effect of aggregate and cement type on long term deformation of concrete.
- The effect of material types on the rebound and properties of shotcrete.
- The use of fibre reinforcing in structural and pavement applications.
- Material properties of foamed concrete.
- High strength concrete.

Further Information on the programme can be obtained from
Prof E Kearsley – Tel: (012) 420 2176: Fax: (012) 362 5218; e-mail elsabe.kearsley@up.ac.za

2.8 SHORT COURSES IN RAILWAY ENGINEERING

2.8.1 General Information

The department is privileged to have the Spoornet Chair in Railway Engineering. Various short courses are offered and are in the process of being converted to credit bearing post graduate modules. Modules in Railway Engineering are offered as full day blocks as detailed below. The necessary credits will be identified.

For enquiries contact Prof Hannes Grabe Tel: (012) 420 4723
e-mail: hannes.grabe@up.ac.za

2.8.2 Short Courses

Introduction to Multi Disciplinary Concepts in Railway Engineering
Brief description: The course provides an introduction to the multi-disciplinary aspects of railway engineering. **Outline of course:** It covers the principles applicable to each railway engineering field as well as a general background on how a railway transport system operates. **Learning outcomes:** An appreciation for the complexities of and multi-disciplinary inter relationships of the railway system.

Geotechnical Aspects for Railway Engineering
Brief description: The course provides an introduction to railway track substructure fundamentals. **Outline of course:** It covers the principles and functions of the layered track foundation system, its drainage and failure modes and how it relates to track performance. Various case studies are included. **Learning outcomes**: An appreciation for the railway track substructure fundamentals and problems and solutions related to its interaction with the track.

Railway Asset Management
Brief description: The course provides an introduction to the general principles of railway asset management. **Outline of course:** It covers the key facets of the management of a railway asset having a life cycle and the relationship between railway asset management as part of a system and of the business plan. **Learning outcomes:** An understanding of the appropriateness of the design of the railway system as related to the prevailing and future business needs and coupled to the development of life cycle maintenance plans and the ability to adapt it to changing business circumstances.

Best Practice for Wheel and Rail Management
Brief description: The course provides an understanding of the interaction between wheel and rail. **Outline of course:** It is based on the manual published by the International Heavy Haul Association (IHHA) in 2001. It draws on information presented at 16 international IHHA conferences and technical sessions between 1978 and 2000. **Learning outcomes:** An understanding of the wheel/rail system and the root causes of wheel and rail damage. A systems approach to wheel and rail management is provided.

2.9 MODULES OFFERED BY OTHER DEPARTMENTS AND UNIVERSITIES

Centre for Environmental Studies

Prof JWH Ferguson Tel: (012) 420 2017; e-mail: willemferguson@zoology.up.ac.za

Environmental Paradigms ENV 810	20 SAQA credits
Environmental Law OMR 881	20 SAQA credits
Environmental Analysis, Assessment and Modeling ENV812	20 SAQA credits

Department of Chemical Engineering – Water Utilisation and Environmental Engineering

Prof E. Chirwa Tel: 012 420 5894; e-mail Evans.Chirwa@up.ac.za

2009 - First Semester – for dates enquire at the department (details will be available on the website of the Department of Chemical Engineering, www.up.ac.za/chemeng)

Environmental Management CEM780	32 SAQA credits
Water Quality Management WQB 780	32 SAQA credits

2009 - Second Semester – for dates enquire at the department

Air Management CAM780/787	32 SAQA credits
Waste Management WAI 780/787	32 SAQA credits

Department of Construction Economics

Prof M Maritz Tel: (012 420 2584; e-mail: tinus.maritz@up.ac.za
Mrs J Theron Tel: +27 (0)12 420 3656; e-mail : joey.theron@up.ac.za
Mrs A Lotz Tel (012) 420 2554; e-mail: alta.lotz@up.ac.za

First semester block weeks 10-14 March and 5-9 May,
June examinations from 09-13 June 2008

Construction Contract Law SKB 811 — 10 SAQA credits

Second semester block weeks 11-15 August and 6-10 October,
November examinations from 10-15 November 2008 including Saturday).

* Dispute Resolution DPS 820 — 10 SAQA credits

* SKB 811 is a prerequisite (GS) for DPS 820

(Handout of information and registration: Saturday 24 January 2009 promptly at 08:00. Venue: Lecture Hall 2-23, 1st floor, Building no. 5, South Campus. University of Pretoria Attendance is very important as information on courses, subjects, prescribed books, study material and pre-block week studies are disseminated)..

Department of Engineering and Technology Management:

Post Graduate courses on an ad hoc basis at the Department of Engineering and Technology Management.

The following courses are available at the Department:

1st Semester	2nd Semester
Technology and Innovation Management Research Methodology Decision Analysis Engineering Economics Systems Engineering	Operations Management Technological Entrepreneurship Engineering Logistics Maintenance Management Quality Management Project Management Research Methodology

Each course is offered by way of two and a half consecutive days of full-time attendance. Class attendance is compulsory and important. Distance support is provided via the Internet (ClickUP system) and complements the contact in the classroom. For this reason, all students are required to have access to the Internet through a suitable browser and be able to take part in discussions using the Internet.

A CD with all the relevant information/study material needs to be obtained from Marlene Mulder. As some of the lecturers will set a test during the lecture days or require that an assignment be submitted, it is necessary to obtain the CD, and access ClickUP system before the lecture days to allow for the necessary study/preparation time. The closing date for registration for these courses is 6 weeks before the lecture days for the specific course. Please contact Marlene Mulder at marlene.mulder@up.ac.za for the timetable and detail w.r.t registration.

Department of Industrial and Systems Engineering

Assistance: Ms Christa Smit; Tel: 012 420 5230; e-mail: christa.smit@up.ac.za
HOD: Prof SJ Claassen, Engineering II Building, room 3-10.

Department of Mathematics and Applied Mathematics

Enquire at this Department.

Department of Mechanical and Aeronautical Engineering

Prof N J Theron Tel: (012) 420 3309; Fax: (012) 362 5087; e-mail: nico.theron@up.ac.za
Mrs M Calder Tel: (012) 420 2096

Advanced Heat and Mass Transfer MHM 732	32 SAQA credits
Design MOX 732	32 SAQA credits
Numerical Techniques and Optimization MNO 732	32 SAQA credits

Department of Town and Regional Planning

Prof M.C Oranje Tel: (012) 420 3535/3531; Fax: (012) 420 3537; e-mail: mark.oranje@up.ac.za

Metropolitan and Urban Area-based Interventions TPI 811	20 SAQA credits
Integrated Development Planning TPD 820	20 SAQA credits
Sustainable Settlement Planning and Design TPS 810	20 SAQA credits
Land Use Management and Land Development TPU 810	20 SAQA credits

UNISA Department of Transport Economics, Logistics and Tourism

Prof A. Brits Tel: (012) 429 4027 Fax: (012) 429 4678; e-mail: britsa@unisa.ac.za

Integrated Logistic Management (TRILOM-G)	24 SAQA credits
Transport Finance and Marketing (TREFEB-N)	24 SAQA credits
Transport Management (TRAMAN-J)	24 SAQA credits

ANNEXURE A: CURRICULA FOR POST-GRADUATE MODULES

A1 PREREQUISITES:

For certain modules prerequisites are indicated. The system of coding is as follows:
AAAnnn: An ordinary module code means that the module should previously have been passed.
(AAAnnn): A module code in parentheses means that lecture attendance should have been satisfactory.
AAAnnn: Underlining means that at least simultaneous enrolment will be required. Satisfactory attendance as well as a pass will therefore also be acceptable.

A2 MODULES PRESENTED WITHIN THE DEPARTMENT OF CIVIL AND BIOSYSTEMS ENGINEERING

Advanced Geotechnics SGS 881 32 SAQA credits
To be determined by the lecturer.

Advanced Geotechnical Engineering SGS 880 32 SAQA credits
To be determined by the lecturer.

Advanced Hydraulics SHC 885 32 SAQA credits
This module is a self study course. A literature study with possible experimental application in the field of hydraulics is required. A formal proposal reflecting detail of the intended research and a motivation for the study should accompany the application. This will be reviewed by the study leader and discussed with the student (year course).

Advanced Hydrology SHC 886 32 SAQA credits
This module is a self study course. A literature study with possible data assessment of historical flood events and hydrological phenomena is required. A formal proposal reflecting detail of the intended research and a motivation for the study should accompany the application. This will be reviewed by the study leader and discussed with the student (year course).

Advanced Structural Analysis SIN 887 32 SAQA credits
Module specially compiled to satisfy specific needs. Topics on advanced structural analysis aspects are selected

Advanced Structural Design SIN 886 32 SAQA credits
Module specially compiled to address specific needs. Topics on advanced structural design aspects are selected.

Advanced Transportation I SVV 882 32 SAQA credits
The module focuses on advanced transportation techniques and is offered as a capita selecta to ensure a broad based detailed understanding of the field of specialisation.

Advanced Transportation II SVV 883 32 SAQA credits
The module focuses on advanced transportation techniques and is offered as a capita selecta to ensure a broad based detailed understanding of the field of specialisation.

Asphalt Technology SGC 798 24 SAQA credits
Composition and engineering properties of bitumen, tar, emulsions and modified binders. Testing methods for binders and bituminous mixtures. Design of prime coats, seals and bituminous mixtures, including stabilisation and recycling. Use of bituminous materials in maintenance.

Basic Applied Hydraulics SHW 786 24 SAQA credits
This course covers aspects pertaining applied hydraulics. Sedimentation and erosion in channels, flow measurement, design of hydraulic structures and storm water drainage systems and culverts, the assessment of the hydrological cycle (precipitation, infiltration, and run-off) to determine surface water yields as well as flood estimation form part of this course.

Basic Concrete Structures SIC 792 24 SAQA credits
Design of beams. Behaviour and design of slabs (solid, ribbed and waffle slabs, flat plates and slabs). Design of slender columns and columns subjected to bi-axial bending. Design of footings (simple and combined), and staircases. Introduction to the design of pre-stressed concrete.

Basic Fundamental Hydraulics SHW 787 24 SAQA credits
This course covers the basic hydraulic principles and their application. Fluid characteristics, hydrostatics, fluid kinematics will be used to consider pipe flow phenomena, pipe network analyses and review of municipal services. An introduction to pumps and water hammer will be discussed as part of the application of the fundamentals of hydraulics in practical problem solving. Exercises to reinforce the basic principles will be covered

Basic Pavement Materials and Design SGM 786 24 SAQA credits
The geological cycle and origina of road building materials, soil testing and classification systems, compaction, stabilization, bitumen and tar, Introduction to pavements, overview of road construction materials, the principles of pavement design. Report writing.

Basic Soil Mechanics SGM 785 24 SAQA credits
Introduction to soil mechanics, classification of soil characteristics, seepage and permeability, stress and strain in saturated and partially saturated soils, Mohr's circle applications

Basic Statistical Methods SHC 797 24 SAQA credits
Basic mathematical methods. Algebra. Matrices and matrix algebra. Series expansions. Differentiation and integration. Probability theory. Graphic analysis. Discrete and continuous probability distributions. Moments and expectation. Statistical sampling and experimental design. Parameter estimation. Confidence intervals. Hypothesis testing. Regression analysis.

Basic Steel Structures SIC 791 24 SAQA credits
Characteristics of steel, design of steel, elements in bending and bending combined with tension and compression, bracing, connections. Design of buildings and portal frames, composite construction, bending resistance of composite sections. Plastic design.

Basic Structural Analysis SIC 790 24 SAQA credits

Virtual work and influence lines, analysis of statically indeterminate structures (two and three-dimensional), slope-deflection, superposition, stiffness and flexibility methods, matrix and computer methods, plastic analysis of portal frames.

Basic Transport and Traffic Engineering SVV 789 24 SAQA credits
Basic concepts and methods for analysing transport system performance (vehicle performance, traffic flow theory, queuing). Introduction to railway engineering. Traffic capacity analysis and capacity design, traffic studies, geometric design principles, intersection design, township road design, traffic signal design. Introduction to transport demand analysis (models and evaluation).

Civil Engineering Special SGC 792 24 SAQA credits
The module focuses on special studies and is offered as a capita selecta to ensure a broad based detailed understanding of the field of specialisation. It is only offered in special circumstances.

Computer Applications for Civil Engineers SHC 880 32 SAQA credits
Basic programming skills is a prerequisite for this course. During this course advanced programming skills will be acquired. The first part of the course is a generic part in which student of all disciplines will participate. During this part the following will be covered: conceptualisation of program layouts, flow diagrams, numerical modelling, solving various problems with mathematical procedures, creating of stand alone software applications, help files and user manuals.
The second part of the course is split into the definite specialised disciplines namely: Water, Geotechnical, Structures etc. The aim in this part of the course is to guide the students to apply their computer programming knowledge to real Civil Engineering problems. The end result of this course is a working program that has value and will assist civil engineers in solving problems. This course is approximately 90% self study (year course).

Concrete Technology SGC 794 24 SAQA credits
Properties of concrete and concrete mixes. Characteristics of Portland cement and supplementary cementitious materials. Aggregates, admixtures and practical design of mixes. Manufacture, curing and testing, including non-destructive methods. Statistical approach to quality control. Time-dependent behaviour and durability of concrete. The principles for appropriate selection of materials and techniques for repair, maintenance and strengthening of civil engineering structures. Investigation and diagnosis. Corrosion of reinforcement. Alkali-aggregate reaction, sulphate attack. Physical degradation. Repair materials. Protective systems. Systems for repair.

Engineering Geology IGL 703 16 SAQA credits
Introduction to Geology, S A stratigraphy and the engineering geology of South Africa. The application of engineering geology in urban and regional development, dams, roads, slopes and tunnels.

Flood Hydrology SHC 792 24 SAQA credits
This course entails the calculation of design flows for different return periods, using the statistical, deterministic - and empirical methods. Dambreak analyses is included in this course as well as channel and level pool routing.

Free Surface Flow SHC 794 24 SAQA credits
This course covers the theory of open channel flow as well as analytical and numerical procedures to analyse three dimensional flow conditions. Furthermore the procedures to determine flood lines and identify hydraulic controls are also covered.

Geometric Design and Traffic Safety SVV 791 24 SAQA credits
Rural/Peri-urban road networks: transportation policy, standards and safety, environmental quality, capacity, design, interchanges. Urban street networks: functional classes, town planning considerations, capacities, environment, safety, standards design, evaluation of road networks.
Traffic safety in global and national content, Road Safety Engineering and the assessment and interpretation of accident information, reactive and proactive identification of remedial measures, traffic safety strategies: 3E model and Haddon matrix.

Geotechnical Design Special SGC 795 24 SAQA credits
A range of design philosophies are introduced, including limiting equilibrium design, stress paths in geotechnical design, probabilistic methods, and design by numerical methods. These design philosophies will be implemented for a number of typical geotechnical structures

Geotechnical Laboratory Testing SGS 785 24 SAQA credits
Theory, application and interpretation of advanced geotechnical laboratory tests. Laboratory Instrumentation. Calibration techniques. Accuracy, precision, resolution, hysteresis. Measurement of force, displacement, pressure and volume change. Stress and strain conditions for laboratory tests. Triaxial stress space, stress paths. Triaxial test, direct shear test, ring shear test, oedometer, Rowe cell, permeameter.

Hydraulic Design SHC 793 24 SAQA credits
This course covers the hydraulic aspects associated with the design of hydraulic structures for dams, road drainage, and other conveyance systems. The hydraulic considerations for the selection and design of energy dissipation structures are assessed in this course.

In Situ Soil Testing and Monitoring SGS 786 24 SAQA credits.
Test procedures and interpretation of the following tests are dealt with in detail, Standard Penetration Test (SPT), Cone Penetration Test (CPT), Piezocone (CPTU), Vane Shear Tests and seismic methods. Philosophy and practice of geotechnical field instrumentation and monitoring. Monitoring techniques and instrumentation design, procurement and installation.

Maintenance Special SVC 780 24 SAQA credits
The module focuses on special studies and is offered as a capita selecta to ensure a broad based detailed understanding of the field of specialisation. It is only offered in special circumstances.

Multimodal Transport SVV 788 24 SAQA credits
The role of public transport in cities; theory and principles of public transport network design, scheduling and operations; terminals; public transport modes; costs, fares and subsidies; contemporary issues and

approaches to public transport restructuring and formalisation in South Africa. Planning and designing for non-motorised transport. Travel demand management and transport system management.

Pavement Design SGC 793 24 SAQA credits
Design philosophy in First and Third World environments; characterising and use of pavement materials; drainage; systems approach to layout, geometric and pavement design; stresses and strains in pavements; mechanistic design methods and elasto-plastic behaviour; economic analysis; designing pavements for streets, gravel and paved roads, runways, and industrial areas. Report writing.

Pipe Flow SHC 795 24 SAQA credits
The focus in this course will be on the practical aspects of pipeline design. The theoretical background to pipeline hydraulics will be covered and practical examples will be assessed. The following specific aspects such as pipeline hydraulics induced dynamic pressures, pipeline component selection and design, pipeline installation and the testing and operation of pipelines will be covered in this course

Pre-stressed Concrete Design SIN 791 24 SAQA credits
Material properties; prestressing systems; flexural design; losses; effects of continuity; shear; deflections; anchorage; cracking; prestressed concrete slabs and detailing

Pump Systems SHW 785 24 SAQA credits
The background theory and design practice of pumping station design will be highlighted. Various hydraulic problems associated to the inlets as well as the planning and design aspects of pump stations will be discussed. Pump selection, dimensioning of the layout to accommodate components required in a pump station (sump design, good design practice, superstructure, lighting ventilation and control, inlet design, switch gear, pump control, surge protection and optimal scheduling of pumping) are some of the aspects that will be evaluated during the course.

Reinforced Concrete Design SIN 778 24 SAQA credits
Material properties. Behaviour and analysis of reinforced concrete members for flexure, axial loads, flexure plus axial load and shear. Cracking and deflection (short- and long-term) of flexural members. Plasticity in flexural members. Braced and unbraced slender columns

Road Rehabilitation Technology SGC 797 24 SAQA credits
Development of road management systems and application to existing street and road networks. Evaluation of, and measurements on existing facilities. Maintenance management. Recycling of materials. Design methods for upgrading, re-construction and strengthening of the existing road infrastructure. Prerequisite: Pavement Design SGC 793.

Soil Mechanics Special SGM 784 24 SAQA credits
Solution of confined and unconfined seepage problems by the method of fragments and finite difference methods. Numerical solutions to consolidation problems and secondary compression. Stress state variables and stress paths in geotechnical structures. Critical state soil mechanics.

Stabilized Materials and Compaction SGC 796 24 SAQA credits
Soil improvement by the addition of additives. Application and effect of additives. Application of stabilization methodology in pavement layers. Theory of soil compaction and soil behaviour under load. Technology related to compaction equipment. Application in pavements.

Statistical Methods SHC 791 24 SAQA credits
Probability theory. Graphic analysis. Discrete and continuous probability distribution. Moments and expectation. Statistical sampling and experimental design. Parameter estimation. Confidence intervals. Hypothesis testing. Analysis of variance. Regression analysis. Cluster analysis. Markov chains. Queuing theory. Reliability and decision analysis. Time series. Monte Carlo Simulation.

Steel Design SIN 776 24 SAQA credits
Introduction to structural reliability, tension elements, buckling of plates in compression elements, compression elements, beams and plate girders, plastic analysis and design of structures and structural elements, connections, composite design and steel-framed structures.

Structural Analysis SIN 790 24 SAQA credits
Stiffness and flexibility methods for plane, grid and three-dimensional structures. In-plane stability of beam-columns and frames; effective lengths and lateral torsional instability of beams. Dynamics: free and forced, undamped and damped framed systems and mass matrices and natural frequencies.

Structural Mechanics SIN 777 24 SAQA credits
Continuum mechanics. Classical and numerical (finite difference and finite element) solutions for plane and plate structures. Plasticity and failure criteria. Elastic stability. Non-linear analysis.

Timber Design SIN 779 24 SAQA credits
Timber properties, grading, treatment, structural form, element design and bracing of structures. Analysis of I-beams, composite beams, frames and connections. Research project.

Traffic Engineering SVC 792 24 SAQA credits
Transportation and land use. Traffic impact studies. Site planning and design. Determination of demand. Traffic control investigations. Intersection design. Internal circulation. Parking areas. Capacity analysis (HCM). SIMTRA and TRANSYT traffic simulation programs

Transportation Planning SVC 789 24 SAQA credits
Introduction to transport planning processes and institutions in S.A. Introduction to contemporary issues in land use/transport planning (including in urban transport; rural transport; air transport; energy and environment). Social, economic, and political impacts and dependencies of transport. Project evaluation, discounting, inflation, engineering economic studies. Benefit - cost analysis. Risk and sensitivity analysis. Social accounting for transport projects.

Transportation Special SVC 791 24 SAQA credits
Module specially compiled to satisfy specific needs

Transportation Studies SVC 790 24 SAQA credits
Basic transportation relationships, land use, data collection and surveys. Four step transportation model, trip generation, trip distribution, modal split, trip assignment, advanced modelling approaches. Introduction to discrete choice models, econometrics, and stated preference analysis. Role of transport modelling in developmental context.

Water Resources Analysis & Management SHC 796 24 SAQA credits
In this course students will be familiarized with the background and procedures used in the creation of flow records and the use of the WRSM2000 model. Surface water systems will be analysed and gross yields will be determined. In the second part of the course the theory and procedures required for the yield determination of surface water resources will be discussed.

A3 MODULES PRESENTED BY OTHER DEPARTMENTS WITHIN THE UNIVERSITY OF PRETORIA

A3.1 Centre for Environmental Studies

ENVIRONMENTAL ANALYSIS, ASSESSMENT AND MODELLING ENV 812 20 SAQA credits
Fundamentals of univariate analysis, statistics, classification and ordination, multivariate statistics, introduction to GIS and remote sensing tools for Environmental Analysis, Assessment and Modelling, spatial statistics, interpolation, kriging, trend surfaces, spatial autocorrelation, regression, risk assessment, social impact assessment

A3.2 Department of Construction Economics

CONSTRUCTION CONTRACT LAW 811 (SKB 811) 10 SAQA credits
The South African legal system, obligations, elements of construction and ancillary contracts, interpretation, breach and remedies in respect of construction contracts, relationships between the owner and the contractor and other participants, law of purchase and sale, law of insurance, tax law, employment contracts, service contracts, mandate, standard contracts and allocation of risk; case studies

DISPUTE RESOLUTION 820 (DPS 820) 10 SAQA credits
Prerequisite : Construction Contract Law 811 (SKB 811)
Dispute resolution in terms of standard contracts: conciliation, adjudication, mediation, arbitration, litigation, law of civil procedure, law of evidence; Arbitration Act: the process of arbitration, advantages and disadvantages of arbitration, appointment of arbitrators, expert witness, awards and remittal thereof, costs; contractual clauses; case studies.

A3.3 Department of Chemical Engineering

AIR MANAGEMENT CAM 780/787 32 SAQA credits

ENVIRONMENTAL MANAGEMENT CEM 780 32 SAQA credits
Introduction and environmental awareness. Integrated environmental management process. Responsible care in industry. Environmental auditing. Environmental law in South Africa. Environmental impact and risk assessments. National and international standards – ISO14000. Environmental economics and public participation.

WASTE MANAGEMENT WAI 780/787 32 SAQA credits
Identify 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, risk assessment and approaches to hazardous waste minimisation, treatment and disposal; The handling, classification and disposal of hazardous waste; Disposal of waste by landfill; Water monitoring at waste management facilities; Recycling and resource management; Waste prevention, minimisation and optimisation.

WATER QUALITY MANAGEMENT WQB 780 32 SAQA credits
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. Ground water quality and assessment; Regulatory aspects including all relevant legislation; Integrated environmental management, integrated pollution control; Procedures to assess effluent discharge impacts; Water quality management; policies and procedures, role of catchment management agencies, catchment management plans.

A3.4 Department of Earth Sciences

ENGINEERING GEOLOGY IGL 703 16 SAQA credits
Introduction to Geology, S A stratigraphy and the engineering geology of South Africa. The application of engineering geology in urban and regional development, dams, roads, slopes and tunnels.

A3.5 Department of Engineering and Technology Management

PROJECT MANAGEMENT IPK 780 16 SAQA credits
Lecturer: Prof H. Steyn
The nature of projects and project management. The project life cycle and project phases. Organisational aspects of project management. Project teams and roles. Processes and methodologies for planning and control – initiating the project. Scope planning, Scope definition and the WBS. Scope management and work authorisation. Scheduling; PERT, CPM. Resource planning, cost estimates and project budgeting. The control process, performance analysis: earned value, BCWS, BCWP, ACWP and performance indices.
Project closure: evaluation, reporting and termination. Project management information systems. Reasons for project successes and failures and continuing improvement. Theory of Constraints Project Management.

A3.6 Department of Town and Regional Planning

METROPOLITAN AND URBAN AREA-BASED INTERVENTIONS TPI 811 20 credits
2 blocks, 14 weeks
Scope, nature and rationale of metropolitan and urban area-based interventions; unique problems in metropolitan areas, for example inner city decay, fringe development, housing, services backlog, the dysfunctional apartheid cityscape and dependency on private transport; types of intervention (inter alia institutional, spatial, economic and social) in order to accomplish restructuring and development in metropolitan areas in South Africa in a relevant, social and environmentally accountable way; policy and legislation regarding urban restructuring and development in South Africa; international and local case studies; impact of globalisation on South African metropolitan areas and major cities; simulated metropolitan and urban area-based intervention exercise.

INTEGRATED DEVELOPMENT PLANNING TPD 820 20 credits
2 blocks, 14 weeks,
Introduction to development and development planning theories; the integrated development planning process; legal, institutional and policy frameworks in which integrated planning functions in South Africa; implementation of integrated development plans; case studies of integrated development planning; simulations of integrated development planning exercises.

A3.7 Department of Industrial and Systems Engineering

OPERATIONS RESEARCH BOZ 780 16 SAQA credits
Lecturer: Dr J Joubert
To gain first-hand experience in formulating and manipulating decision models. Focuses on the design and practical application of decision support systems by using available computer software. It covers applied mathematical programming and optimization, and special topics include:
Multiobjective optimization models; stochastic programming; nonlinear and combinatorial applications and heuristic and mataheuristic solution algorithms.

A4 MODULES PRESENTED OUTSIDE THE UNIVERSITY OF PRETORIA

A4.1 Transportation related modules presented by UNISA

TRANSPORT FINANCE AND MARKETING (TREFEB-N) 24 SAQA credits
Costing as a Basis of Tariff Quoting; Finance and Financial Management; Financial Planning and Control; Investment Decision Making; Marketing Communications Policy and Public Relations; Marketing Research and Market Segmentation; Market-orientated Strategic Planning; Principles of Price Theory; Product and Distribution Policy; Sources of Financing; Tariff Policy; Transport Investment Practice

TRANSPORT LOGISTICS (TRALOG-6) 24 SAQA credits
Conceptual Framework and Structure; control of Logistics Costs; Customer Service and Marketing Strategy (including Distribution Policy); handling and packaging; inventories; location of nodes; logistics control; Logistics Information Systems; planning for Transport Logistics; Strategic Transport Decisions in Logistics; the Structuring and Integrated Management of Logistics; the Transport System; the Warehousing Function; Transport Logistic Operations Management; Transport Logistic Requirements Planning

TRANSPORT MANAGEMENT (TRAMAN-J) 24 SAQA credits
Effective Implementation of the Operations Function; fleet Planning; introduction of Transport Management; schedule of Transport Services; Service Planning; Strategic Management; the Task of Transport Management; the Transport Management Environment; Transport Enterprise Management.

The equivalence of these three UNISA modules, equivalent to 24 credits each are:

Integrated Logistic Management (TRILOM-G)	= Transport Logistics SVV 787
Transport Management (TRAMAN-J)	= Transport Management SVV 786
Transport Finance and Marketing (TREFEB-N)	= Transport Economics SVV 782

ANNEXURE B - 2009 STUDY PROGRAMME PLANNER

The pages in this annexure are provided to assist the student in planning his/her study programme. (They also mirror a form that is to be completed at registration).

The next page (page B2) is primarily administrative in that it records the study direction and degree for which the student is registered, the post-graduate modules for which credits have already been obtained and personal particulars required for the registration process.

Page B3 shows the modules that are compulsory for each specific discipline. Those shown as 'B' are compulsory for BSc (Hons)(Applied Science) and MSc(Applied Science) students and those shown as 'C' are compulsory for all honours and masters students. The years in which the module will be presented are also shown. If the module is presented in the block week it is shown with 'S' in the year ('1' following the 'D' indicates a first semester module and a '2' indicates a second semester module). A 'D' symbol is shown that the module is presented as a "block day" module and an 'E' symbol shows that it is presented in the evenings. A column is provided for the student to check the module/credits that have already been obtained by the student.

Page B4 shows the modules and presented in the first semester. Modules that are 'recommended' for each discipline.

Page B5 shows the modules that are presented in the second semester.

When selecting a set of modules for a year of study, students must ensure that:

- The module is being presented in that year.
- The module times do not clash with other modules the student intends taking (Check the block week time table (pg B6) and the calendar (Annexure C)).
- Modules being selected take into account the requirements of the discipline in respect of the "compulsory" and "recommended" module.
- If specified, the prerequisite course has already been passed.

Registration: Department of Civil and Biosystems Engineering 2009

DESCRIPTION	STUDY CODE	DESCRIPTION	STUDY CODE
GEOTECHNICAL		**URBAN**	
BEng(Hons) (Geotechnical Engineering)	12240212	BEng(Hons)(Urban Engineering)	12240213
BSc(Hons)(Applied Sc)(Geotechnics)	12243019	BSc(Hons)(Appied Science) (Urban)	12243032
MEng (Geotechnical Engineering)	12250212		
MSc(Applied Science) (Geotechnics)	12253019		
STRUCTURAL		**WATER RESOURCES**	
BEng(Hons) (Structural Engineering)	12240121	BEng(Hons) (Water Resources Engineering)	12240161
BSc(Hons)(Applied Science)(Structures)	12243031	BSc(Hons)(App Sc) (Water Resources)	12243030
MEng (Structural Engineering)	12250121	MEng (Water Resources Engineering)	12250161
MSc(Applied Science) (Structures)	12253036	MSc(Applied Sc) (Water Resources)	12253031
TRANSPORTATION			
BEng(Hons) (Transportation Engineer)	12240111		
BSc(Hons)(Appl Sc)(Transport Planning)	12243028		
MEng (Transportation Engineering)	12250111		
MSc (App Sc) (Transport Planning)	12253028		
Engineering Special (P.G)			12280001
MSc Transportation Planning			12251091
PhD Civil Engineering			12263071
PhD Civil			12263221
PhD Transportation Engineering			12263101

Student information

SURNAME		STUDENT NO		
FIRST NAMES		FULL TIME	YES	NO
TITLE		PART TIME	YES	NO
STUDY YEAR				
MODULES ALREADY PASSED				

FIRST SEMESTER COURSES

Module Code	Module Name	SAQA Credits	Geotechnical	Structure	Transport	Water	2009	2010	2011	Courses passed
SIC 792	Basic Concrete Structures	24		CB			S1		S1	
SGM 785	Basic Soil Mechanics	24	B				S1	S1	S1	
SHC 797	Basic Statistical Methods	24		B	B		D1	D1	D1	
SIC 791	Basic Steel Structures	24		C			S1	S1		
SIC 790	Basic Structural Analysis	24		C			S1		S1	
SVV 789	Basic Transport and Traffic Engineering	24			B		D1	D1	D1	
SGC 794	Concrete Technology	24		X	X	X	K1		K1	
SKB 811	Construction Contract Law	10					S1	S1		
IGL 703	Engineering Geology	16	X		X		S1	S1	S1	
COM 780	Environmental Management	32	X		X	X	D1	D1		
ENV 810	Environmental Paradigms	20				X	D1	D1		
SHC 792	Flood Hydrology	24				X		W1		
SGS 785	Geotechnical Laboratory Testing	24	C					S1		
SHC 793	Hydraulic Design	24				X	W1		W1	
SVV 788	Multimodal Transport	24			X		S1		S1	
SGC 793	Pavement Design	24	X		X		S1	S1	S1	
SHC 795	Pipe Flow	24				X		W1		
SIN 791	Prestressed Concrete Design	24		X			S1			
SHW 785	Pump Systems	24				X	W1		W1	
SGM 784	Soil Mechanics Special	24	C				S1		S1	
SGC 796	Stabilized Materials & Compaction	24	X		X			S1		
SHC 791	Statistical Methods	24	X	X	C		S1	S1	S1	
SIN 790	Structural Analysis	24		X			S1	S2		
SVC 792	Traffic Engineering	24			X			S1		
SVC 789	Transportation Planning	24			C		S1	S1	S1	
WCH 780	Water Chemistry	16				X				
WMB 780	Water Microbiology	16				X	S1C			
WQB 780	Water Quality Management	32					S1C			

X Recommended
D1 1st Semester Full day block
S1 1st Semester block week
C Compulsory
K1 3 day block
W Water Resources Engineering (outside normal block week) See paragraph 1.4.8
B Compulsory for Applied Science students (outside normal block week)
S1C Chemical Engineering block week

Circle the module code for modules that are to be taken in this semester.

FIRST AND/OR SECOND SEMESTER

Module Code	Module Name	SAQA Credits	Geotechnical	Structure	Transport	Water	2008	2009	2010	Courses passed
SGS 881	Advanced Geotechnics	32	X							
SGS 880	Advanced Geotechnical Engineering	32	X							
SHC 885	Advanced Hydraulics	32				X	X	X	X	
SHC 886	Advanced Hydrology	32				X	X	X	X	
SIN 887	Advanced Structural Analysis	32		X			X	X	X	
SIN 886	Advanced Structural Design	32		X			X	X	X	
SVV 882	Advanced Transportation I	32			X		X	X	X	
SVV 883	Advanced Transportation II	32			X		X	X	X	
SGC 792	Civil Engineering Special	24		X						
SHC 880	Computer Applications for C E	32	X	X	X	X	X	X	X	
SVC 780	Maintenance Special	24								
INM 781	Research Methodology	16					X	X	X	
SVC 791	Transportation Special	24			X					

X Recommended
D1 Full day block 1st Semester
E1 Evening 1st Semester

XC Recommended for specialization in Rural Develop
S1 1st Semester block week

Circle the module code for modules that are to be taken in this semester.

SECOND SEMESTER COURSES

Module Code	Module Name	SAQA Credits	Geotechnical	Structure	Transport	Water	2009	2010	2011	Courses passed
SGC 798	Asphalt Technology	24			X		S2		S2	
SHW 786	Basic Applied Hydraulics	24				B		W2		
SHW 787	Basic Fundamental Hydraulics	24				B	W2		W2	
SGM 786	Basic Pavement Materials & Design	24			B		D2	D2	D2	
WBW 780/7	Biological Water Treatment	32				X	S2	S2	S2	
WCW 780	Chemical Water Treatment	32					S2C		S2C	
DPS 820	Dispute Resolution	10					S2	S2	S2	
ENV 812	Environ Analysis, assess & model	20				X	D2	D2	D2	
OMR 811	Environmental Law	20					D2	D2	D2	
SHC 794	Free Surface Flow	24				X		W2		
SVV 791	Geometric Design and Safety	24	X		X		S2		S2	
SGC 795	Geotechnical Design Special	24	C				S2		S2	
SGS 786	In-Situ Soils Testing & Monitoring	24	C					S2		
TPD 820	Integrated Develop Planning	20			X		S2	S2	S2	
IPK 780	Project Management	16					D2	D2	D2	
SIN 778	Reinforced Concrete Design	24		X		X	S2		S2	
SGC 797	Road Rehabilitation Technology	24			X			S2		
SIN 776	Steel Design	24		X			S2		S2	
SIN 777	Structural Mechanics	24		X			S2		S2	
SIN 779	Timber Design	24		X			S2		S1	
SVC 790	Transportation Studies	24			X			S2		
WAI 780	Waste Management	32				X	S2C			
WRO 880/7	Waste Water Treatment Plant Design	32						S2C		
SHC 796	Water Resources Analysis /Man'ment	24				X	W2		W2	
WDO 880/7	Water Treatment Plant Design	32				X	S2C		S2C	

X	Recommended		
D2	2nd Semester Full day block	S2	2nd Semester block week
C	Compulsory	B	Compulsory for Applied Science students
S2C	Chemical Engineers block week	K	3 day block (outside normal block week)
W	Water Resources Engineering (outside normal block week) See paragraph 1.4.8		

Circle the module code for modules that are to be taken in this semester.

Schedule of Lectures

The planned block week schedule is shown below. When choosing modules, students should ensure that their choices fit in with the timetable. No clashes are allowed, as these may also affect the examination timetable.

FIRST SEMESTER:

Time	Geotechnics	Structures	Transportation	Water
07:30 - 08:20		Basic Steel Structures	Transp Plan	DATE WILL BE SET FOR A FEEDBACK/ DISCUSSION SESSION
08:30 – 09:20		SIC 791	SVC 789	
09:30 - 10:20	Soil Mech Sp	Basic Conc Structures	Pavt Des 793	
10:30 - 11:20	SGM 784	SIC 791	Multimodal Transp	
11:30 - 12:20	IGL703	Structural Analysis 790	SVV 788	
12:30 – 13:20		Basic Struc Anal 790		
13:30 - 14:20	Basic Soil Mech		Statistical Methods	
14:30 - 15:20	SGM 785		SHC 791	
15:30 - 16:20			Pavt Des 793	
16:30 - 17:20				
17:30 - 18:20				
18:30 - 19:20				

SECOND SEMESTER:

Time	Geotechnics	Structures	Transportation	Water
07:30 - 08:20		Timber Design		DATE WILL BE SET FOR A FEEDBACK/ DISCUSSION SESSION
08:30 - 09:20		SIN 779		
09:30 - 10:20	Geotech Des Sp	Reinf Conc Design		
10:30 - 11:20	SGC 795	SIN 778	Asphalt Tech	
11:30 - 12:20		Structural Mechanics	SGC 798	
12:30 – 13:20		SIN 777		
13:30 - 14:20				
14:30 – 15:20				
15:30 – 16:20			Geom/safety	
16:30 – 17:20			SVV 791	
17:30 – 18:20				
18:30 – 19:20				

The allocation of lecture halls as well as examination timetable is displayed on the post-graduate notice board in the basement of Engineering 1 at the start of a particular block week.

BLOCK WEEKS FOR MODULES OFFERED BY DEPT OF CIVIL ENGINEERING

First semester	2-6 March and 20-24 April 2009
Structural division additional week	25 – 29 May 2009
1st Semester examinations	20-25 July 2009
1st Semester examinations for **structural students**	22-26 June 2009
Water Resources Engineering	**26 January – 4 February 2009**
Second semester	17- 21 August and 5-9 October 2009
Structural division additional week	2 – 6 November 2009
2nd Semester examinations	2 - 6 November 2009
2nd Semester examinations for **structural students**	30 Nov – 2 December 2009
Water Resources Engineering	**29 July – 5 August 2009**

ANNEXURE C: 2009 CALENDAR

	January	February	March	April	May	June
Wed				1		
Thurs	1 New Year			2		
Fri	2			3	1 Workers Day	
Sat	3			4	2	
Sun	4	1	1	5	3	
Mon	5	2	2	6	4	1
Tues	6	3	3	7	5	2
Wed	7	4	4	8	6	3
Thurs	8	5	5	9	7	4
Fri	9	6	6	10 Good Friday	8	5
Sat	10	7	7	11	9	6
Sun	11	8	8	12	10	7
Mon	12	9	9	13 Family Day	11	8
Tues	13	10	10	14 Lectures start	12	9
Wed	14	11	11	15	13	10
Thurs	15	12	12	16	14	11
Fri	16	13	13	17	15	12
Sat	17	14	14	18	16	13
Sun	18	15	15	19	17	14
Mon	19	16	16	20	18	15
Tues	20	17	17	21	19	16 Youth Day
Wed	21	18 Basic stats	18	22	20 Lectures end	17
Thurs	22	19 Basic Transp	19	23	21	18
Fri	23	20 Basic Transp	20	24	22	19
Sat	24 PG Registr	21	21 Human R Day	25	23	20
Sun	25	22	22	26	24	21
Mon	26	23	23	27 Freedom Day	25	22
Tues	27	24	24 Basic stats	28	26	23
Wed	28 Lecture	25	25 Basic stats	29	27 B stats	24
Thurs	29	26	26 Basic Transp	30	28 B Trans	25
Fri	30	27	27 Basic Transp		29 B Trans	26
Sat	31Jool/Rag	28	28		30	27
Sun			29		31	28
Mon			30			29
Tues			31 Lectures end			30

Water block

Post Grad block

Post Grad block

Water block

Structural block

Structural Exams

	July	August	September	October	November	December
Tues			1			1
Wed	1		2			2
Thurs	2		3	1		3
Fri	3		4	2		4
Sat	4	1	5	3		5
Sun	5	2	6	4	1	6
Mon	6	3	7	5 Lectures start	2	7 Acad year ends
Tues	7	4	8	6	3	8
Wed	8	5	9 Spring Day	7	4	9
Thurs	9	6	10	8	5	10
Fri	10	7	11	9	6	11
Sat	11	8	12	10	7	12
Sun	12	9 Women's Day	13	11	8	13
Mon	13 Lectures start	10 Publ Holiday	14	12	9	14
Tues	14	11	15	13	10	15
Wed	15	12	16	14	11	16 Reconciliation
Thurs	16	13	17	15	12	17
Fri	17	14	18	16	13	18
Sat	18	15	19	17	14	19
Sun	19	16	20	18	15	20
Mon	20	17	21	19	16	21
Tues	21	18	22	20	17	22
Wed	22 BPavt	19	23 Lectures end	21	18	23 UP closes
Thurs	23 BPavt	20	24 Heritage Day	22	19	24
Fri	24 BPavt	21	25	23	20	25 Christmas
Sat	25	22	26	24	21	26 Goodwill Day
Sun	26	23	27	25	22	27
Mon	27	24	28	26	23	28
Tues	28	25	29	27	24	29
Wed	29	26	30	28	25	30
Thurs	30	27		29 Lectures end	26	31
Fri	31	28		30	27	
Sat		29		31	28	
Sun		30			29	
Mon		31			30 Struct'l Exam	

Structural Exams

Water block

Post grad block

PG Examinations
Structural block

PG Examinations

Post grad block

Water block

ANNEXURE D - PREPARATION OF REPORTS, DISSERTATIONS AND THESES

Students registering for Masters degrees are required to have identified a suitable research topic in consultation with the head of discipline prior to registration.

Before starting their research, Masters students are required to prepare a planning report, which covers the following aspects:

- Proposed title of the project report
- Introduction and background to the study
- Problem statement
- Objectives of the study
- Scope and extent of the study
- Provisional format of the report in the form of an index
- Detailed work program, including a bar chart.

In the case of doctoral students, the planning report must also have a section discussing the contribution that the research will make to the state of knowledge on the topic and be accompanied by a 3-page CV of the student, (including a list of previous publications and experience) and a copy of the student's Master's dissertation or research report. These are submitted by the Head of Division to the Department's Review Committee in support of the student's application for admission to the doctoral programme.

All students must prepare their project reports, dissertations or theses in accordance with the "*Guidelines for reports, dissertations and theses*" prepared by the department in March 2000, which is available on www.ais.up.ac.za/ebit/guides/siviel.pdf