



**Faculty of Engineering, Built  
Environment and Information  
Technology**



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

**DEPARTMENT OF  
MINING ENGINEERING**

**2022**

**Postgraduate  
Brochure**

[www.up.ac.za/mining-engineering](http://www.up.ac.za/mining-engineering)  
*Last Revision: October 2020*

<b>1. INTRODUCTION .....</b>	<b>3</b>
<b>2. GENERAL .....</b>	<b>4</b>
A. YEARBOOKS.....	4
B. UP POLICIES.....	4
C. CLICKUP .....	4
D. ONLINE ASSESSMENT .....	5
E. ADMINISTRATIVE CONTACT INFORMATION .....	5
F. DEPARTMENT CONTACT INFORMATION .....	5
G. ORIENTATION DAY .....	5
H. PLAGIARISM - <a href="http://www.library.up.ac.za/plagiarism/index.htm">HTTP://WWW.LIBRARY.UP.AC.ZA/PLAGIARISM/INDEX.HTM</a> .....	6
I. LIBRARY - <a href="http://www.library.up.ac.za">WWW.LIBRARY.UP.AC.ZA</a> .....	6
<b>3. STUDY OPTIONS .....</b>	<b>6</b>
<b>4. ADMISSIONS REQUIREMENTS .....</b>	<b>7</b>
A. HONOURS DEGREES: (MINIMUM DURATION: ONE YEAR / MAXIMUM THREE YEARS) (NQF LEVEL 8) .....	7
B. MASTER'S DEGREES: (MINIMUM DURATION: ONE YEAR / MAXIMUM TWO YEARS) (NQF LEVEL 9).....	7
C. DOCTORATES: (MINIMUM DURATION: TWO YEARS / MAXIMUM THREE YEARS) (NQF LEVEL 10) .....	7
<b>5. APPLICATION PROCESS.....</b>	<b>8</b>
A. HONOURS APPLICATIONS .....	8
B. MASTERS AND PHD APPLICATIONS.....	9
C. CLOSING DATES.....	9
D. ONLINE APPLICATIONS .....	9
E. INTERNATIONAL STUDENTS.....	10
F. FEES AND FUNDING .....	10
G. MODULE CHANGES AND TERMINATIONS OF STUDIES .....	10
<b>6. REGISTRATION PROCESS .....</b>	<b>11</b>
A. GENERAL .....	11
B. PROBLEMS WITH ONLINE REGISTRATIONS .....	11
C. STUDENT CARDS.....	11
<b>7. PROGRAM AND MODULE INFORMATION.....</b>	<b>12</b>
A. BENG (HONS) (MINING ENGINEERING) (12240072) (128 CREDITS) .....	12
B. BSc (APPLIED SCIENCE) (12243035) (128 CREDITS) .....	15
C. MENG (MINING ENGINEERING) (12250072) (180 CREDITS) .....	17
D. MSc (APPLIED SCIENCE) (12253072) (180 CREDITS).....	17
E. PHD ENG (MINING ENGINEERING) (12263062) (360 CREDITS) .....	17
F. PHD (MINING) (12263192) (360 CREDITS) .....	18

## 1. INTRODUCTION

The postgraduate degree programs in the Department are open to graduates holding a recognised degree in either Engineering (BEng), Science (BSc) or technology (BTech). The courses are intended for graduates who wish to enhance their skills in Mining Engineering, or for other professionals who wish to further their academic qualifications in aspects of Mining Engineering.

The courses offer subjects in a broad spectrum, covering introductory aspects of mining engineering, through to consolidation, skills enhancement and mining research-related projects, dissertations and theses. A number of courses may be taken from other engineering disciplines if the student requires specialist knowledge not available in the Mining program (program specific). Students should refer to the appropriate Departmental brochure for further details of these courses.



Tuition is organised as self-study modules to enable you to work and study full-or part-time at your own pace, however contact sessions may be required for individual modules. Each course provides you with a full set of notes and/or lecture material.



Individual lecturer contact sessions can be scheduled throughout the term where you can discuss course material on a one-to-one basis with the lecturer.

Examinations are held at the department on the Hatfield campus, during **June - July** (for first semester courses) and

**December - January** (for second semester courses).

With all these study opportunities to increase your knowledge and skills in contributing to the growth of our industry, country and continent I look forward to welcoming you to the program.

*Prof Ronny Webber-Youngman*

**Head: Department of Mining Engineering**

University of Pretoria

Email: [ronny.webber@up.ac.za](mailto:ronny.webber@up.ac.za)

"Educating and leading mining engineers to become Imagineers"

#UPMiningMatters

## 2. GENERAL

### a. Yearbooks

This information brochure should be read in conjunction with the following Yearbook of the (EBIT Faculty) University of Pretoria. Please follow the website link mentioned herewith: <http://www.up.ac.za/yearbooks/home>

Irrespective of any comments contained in this brochure, the following will apply:

- General Regulations, Rules & Glossary of Terms;
- Faculty of Engineering, Built Environment and Information Technology Yearbook

Note that the academic status of degrees obtained at other universities, especially graduates from overseas Universities, need to be clarified with the Student Administration Offices. Refer also to the Regulations G.29-G.38 part 1, of the relevant year(s) of registration.

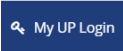
**Although every attempt was made to ensure that this brochure is correct and up to date at the time of publishing, the Department reserves the right to make changes without prior notice and without prejudice.**

### b. UP Policies

Please click the link [here](#) to see the latest UP related policies.

### c. clickUP

clickUP is the online learning management system of the University of Pretoria that acts as a virtual classroom. All Postgraduate students will have access to clickUP once **registered**.

clickUP can be accessed directly at <https://clickup.up.ac.za/> or you can login via "MyUP Login" from the Homepage on the University of Pretoria's  website. Sign on to [www.up.ac.za](http://www.up.ac.za), and click this icon on the top of the page.

For help accessing the UP Student Portal, visit <https://www1.up.ac.za/uplogin/faces/docs/UPPortal-Help-UPLogin.pdf> or click on 'Need help' on the UP Student Portal login page.

Students will then be navigated to the "UP Student Portal" where his/her registered modules will be listed. Each module has a unique site that contains lecturer details, study guide, prescribed material, and announcements. It also hosts facilities to conduct e-mail communication(s). Since clickUP is the official means through which lecturers communicate to all students, students must visit clickUP regularly and ensure that their latest e-mail addresses are registered in clickUP.

Additional information may be obtained from the Student Help Desk at:



- E-mail: [studenthelp@up.ac.za](mailto:studenthelp@up.ac.za)
- Tel: +27 12 420 3837
- Mondays – Fridays 07:00 – 16:30

#### d. Online Assessment

Dependent on the current COVID 19 state, all formal assessments might be online on the clickUP learning management system. Information relating to the online assessments will be available with sufficient advance notice.

*"The University of Pretoria commits itself to produce academic work of integrity. I affirm that I am aware of and have read the Rules and Policies of the University, more specifically the Disciplinary Procedure and the Tests and Examinations Rules, which prohibit any unethical, dishonest or improper conduct during tests, assignments, examinations and/or any other forms of assessment. I am aware that no student or any other person may assist or attempt to assist another student, or obtain help, or attempt to obtain help from another student or any other person during tests, assessments, assignments, examinations and/or any other forms of assessment."*

#### e. Administrative contact information

Further enquiries with regard to all **applications, registrations and administration** of the student's application, please contact the following persons:

<b>General Administration</b> ( <i>Applications, registrations &amp; administrations</i> ) <b>(EBIT Student Administration, Engineering I building, level 6)</b>			
<b>Honours</b>	Ms Miechaine Buys	012 420 5316	<a href="mailto:miechaine.buys@up.ac.za">miechaine.buys@up.ac.za</a>
<b>Masters</b>	Ms Stefanie Steenberg	012 420 5315	<a href="mailto:stefanie.steenberg@up.ac.za">stefanie.steenberg@up.ac.za</a>
<b>PhD</b>	Mr Kenneth Nkanyana	012 420 6735	<a href="mailto:kenneth.nkanyana@up.ac.za">kenneth.nkanyana@up.ac.za</a>

#### f. Department contact information

For any **departmental or subject related enquiries**, please contact the following persons:

<b>Departmental Contacts</b>		
Administration enquiries	Ms Marietha Hicks <a href="mailto:mining.postgrad@up.ac.za">mining.postgrad@up.ac.za</a>	012 420 3196
Coordinator for postgraduate studies; curriculum structure, all postgraduate degrees	Mr Jannie Maritz	012 420 4571

#### g. Orientation day

There will be an orientation day for all Honours students in the first semester of each study year. This event will take place in February of the new academic year and is mainly for new first year Honours students, but all Honours students are welcome to attend. Attendance of this event is **compulsory for first year Honour students**. Programme orientation, meeting with academic personnel, "clickUP" training (e-learning), all administrative details and issuing of student cards, etc. are part of the discussions on this day.

More information will be made available to students before the closing of the current academic year.

**\*\* Due to the COVID state, this will not take place in 2022 \*\***



**h. Plagiarism - <http://www.library.up.ac.za/plagiarism/index.htm>**

Students who commit plagiarism will lose all credits obtained in the plagiarised work. The matter shall also be referred to the Disciplinary Committee (Students) for a ruling. Plagiarism is regarded as a serious contravention of the University's rules and can lead to expulsion from the University.

Please refer to Plagiarism Prevention Policy available at the following website:

<https://www.up.ac.za/article/2754069/up-policies-and-other-important-documents>

Also see all training opportunities available regarding plagiarism, referencing and software available for your studies - <http://www.library.up.ac.za/training/index.htm>

**i. Library - [www.library.up.ac.za](http://www.library.up.ac.za)**



A Graduate Research writing module in clickUP is a support module and has been setup for postgraduate students. This module is a space for students to upload copies of their papers or dissertations through Tii for their own use.

To register for this module, go to the Library Services homepage and select /services/plagiarism /Turnitin/Turnitin for post graduates.

### 3. Study Options

Postgraduate studies at the Mining Engineering department is structured as follows:

Prospective students with a BEng (or equivalent) degree at a university that is accredited for this purpose in terms of the Washington Accord).

- [BEngHons Mining Engineering \(128 credits\)](#)
- [MEng Mining Engineering \(180 credits\)](#)
- [PhD Mining Engineering \(360 credits\)](#)

All other prospective students will follow the Applied Science route

- [BScHons Applied Science Mining \(128 credits\)](#)
- [MSc Applied Science Mining \(180 credits\)](#)
- [PhD Mining \(360 credits\)](#)

## 4. Admissions Requirements

### a. Honours degrees: (minimum duration: one year / maximum three years) (NQF level 8)

- **Bachelor of Engineering (Honours) – BEng (Hons):**
  1. BEng (Mining) degree awarded by the University of Pretoria or relevant four-year bachelor's degree in engineering that the Engineering Council of South Africa (ECSA) regards as acceptable for registration as a candidate engineer and for eventual registration as a professional engineer
  2. A weighted average of at least 60%
  3. At least 2 years mining work experience
  4. An entrance examination may be required
  5. Comprehensive intellectual CV
- **Bachelor of Science (Honours) – BSc (Applied Science) Mining:**
  1. A three-year BSc degree (or equivalent) degree in Natural Sciences with a cumulative weighted average of at least 60% or;
  2. A relevant BTech qualification excluding the National Diploma, i.e. one offered by a department of Mining Engineering at a university of technology in South Africa, with a weighted average of at least 75% AND NO modules failed in the BTech degree or;
  3. A relevant Advanced Diploma qualification (NQF Level 7), excluding the National Diploma; i.e. one offered by a department of mining engineering at a university of technology in South Africa AND NO modules failed in the Advanced Diploma
  4. A minimum of five years' mining experience
  5. An entrance examination may be required
  6. Comprehensive intellectual CV is compulsory

### b. Master's degrees: (minimum duration: one year / maximum two years) (NQF level 9)

The Master's program is a part time program with no course work, only a dissertation.

- **Master of Engineering – MEng:**

For students who have obtained a BEng (Hons) Mining Engineering degree or accredited equivalent.
- **Master of Science - MSc Applied Science Mining:**

For students who have obtained a BSc (Applied Science) degree or accredited equivalent.

### c. Doctorates: (minimum duration: two years / maximum three years) (NQF level 10)

- **Doctor of Philosophy in Engineering – PhD (Eng):**

For students who have obtained a MEng Mining Engineering degree (or equivalent). This means that the Master's degree must have been a research based degree. In the case of a taught Master's degree, additional admission requirements may be imposed.
- **Doctor of Philosophy – PhD:**

For students who have obtained a MSc Applied Science Mining degree (or equivalent). This means that the Master's degree must have been a research based degree. In the case of a taught Master's degree, additional admission requirements may be imposed.

As per discretion of the Mining Research Committee and the appointed supervisor, [Introduction to research, EIN 732](#), or equivalent module might be required to be completed before admissions to the Masters and PhD Mining programme will be considered.

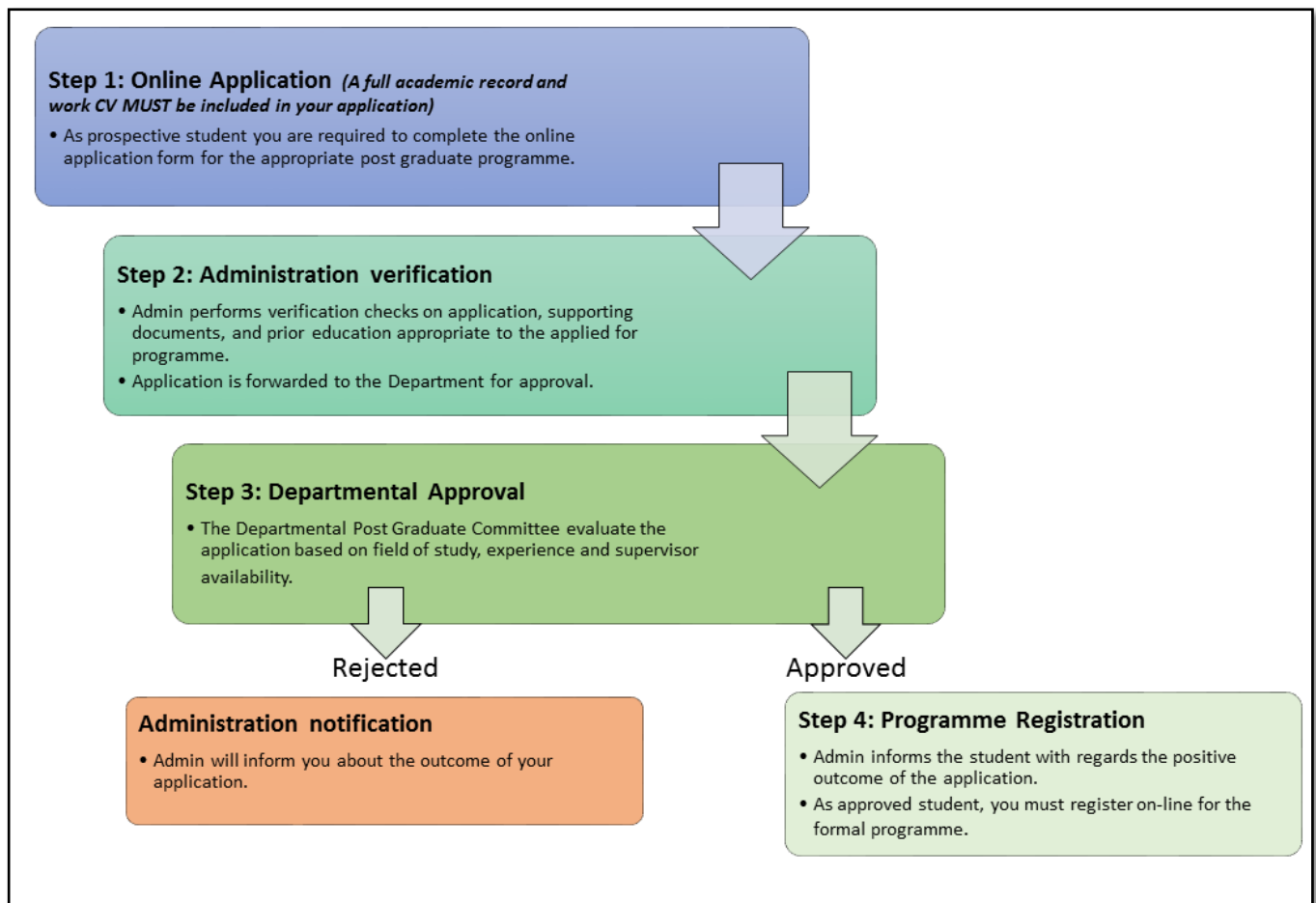
Acceptance to any of the relevant routes are subjective to minimum requirements. The departmental Postgraduate Committee reserves the right to make a thorough assessment of the Applicant's academic transcript and CV, and to decide if the applicant is suitable for postgraduate studies. This assessment may include an oral or written entrance examination.

### Selection process

The departmental Postgraduate Committee reserves the right to make a thorough assessment of the applicant's academic transcript and CV, and to decide if the application is suitable for postgraduate studies. This assessment may include an oral or written entrance examination.

## 5. Application Process

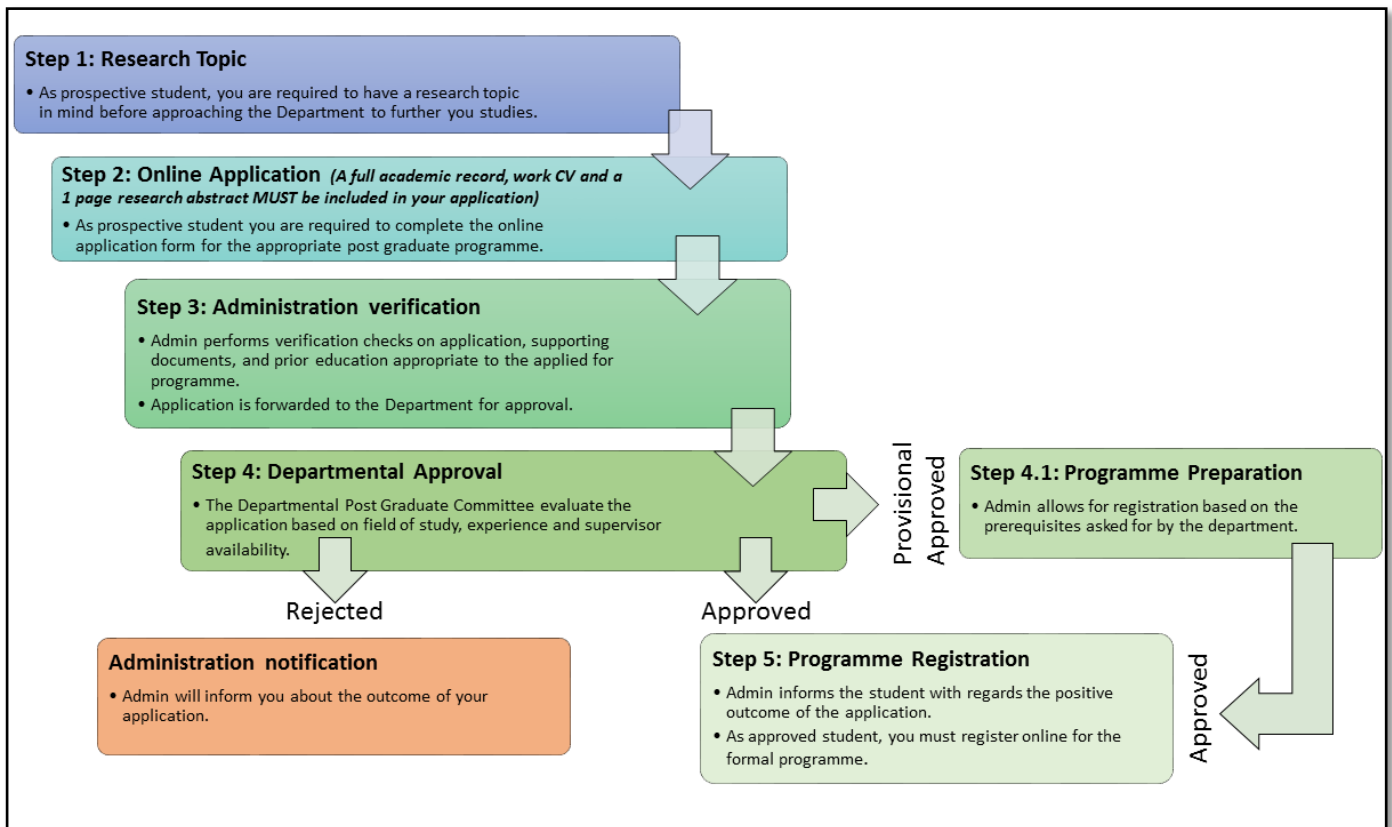
### a. Honours applications



**Note:** All Honours applications **MUST** include a full **Academic Record** and **Curriculum Vitae** that contains all the relevant work experiences.



## b. Masters and PhD applications



**Note: All Masters and PhD applications MUST include a full academic record, Curriculum Vitae, a research topic together with a research abstract (1 page only).**

## c. Closing dates

The closing dates for applications for admissions are:

- For Honours studies – 31<sup>st</sup> of October of each year  
**NO late applications** for Honours studies will be accepted after this date
- Master's and Doctorate studies – Discretion of the department

The departmental committee meet every quarter for scrutiny of all applicants. This will take place in March, June, September and November. Depending on the date of application, feedback will be available after the scheduled meeting.

## d. Online applications

Click here for the online link: <https://www.up.ac.za/online-application>

Once your application has been submitted, you may however contact the Student Service Centre in writing at [ssc@up.ac.za](mailto:ssc@up.ac.za) if you wish to add any additional information, or make any changes to your application.

To check your application status, please refer to:

<https://www.up.ac.za/online-application/article/2746918/application-status>

### e. International Students

UP registrations for the 2021 academic year are fully online.

- International students need to comply with immigration requirements. For assistance and enquiries, email [isd@up.ac.za](mailto:isd@up.ac.za).
- The registration guidelines show you step by step how to register successfully. In case of difficulties, contact the online registration help desk on telephone +27 (0) 12 420 5347 or email us at [registration@up.ac.za](mailto:registration@up.ac.za).
- Various holds may prevent you from registering successfully. Please check for holds on the UP Student Centre.
- Consult the Yearbooks for information on which modules to choose and curriculum.

For more information on above, please go to:

<https://www.up.ac.za/online-registration/article/2398818/international-students>

### f. Fees and Funding

Once you have been accepted to study the programme of your choice, fees are payable.

**NOTE** that the Mining Department are NOT responsible for ANY funding.

Click on the link for the Postgraduate fee structure:

<https://www.up.ac.za/article/2749200/fees-and-funding>

Financial Enquiries	
Ms Komane Lehong	<a href="mailto:komane.lehong@up.ac.za">komane.lehong@up.ac.za</a>
Mr Frans Mothogoane	<a href="mailto:frans.mothogoane@up.ac.za">frans.mothogoane@up.ac.za</a>
Ms Rose Malinga	<a href="mailto:rose.malinga@up.ac.za">rose.malinga@up.ac.za</a>

### g. Module changes and terminations of studies

If a student decide during the academic year to discontinue any modules for which he/she enrolled, a form should be obtained, completed and submitted at Student Administration.

Please NOTE that late cancellations will result in payment of full fees. Refer to University Calendar for details of latest date to cancel without penalties (<http://www.up.ac.za/calendars>).

To discontinue studies, a student should refer to the Student Service Centre ([ssc@up.ac.za](mailto:ssc@up.ac.za)). Should a student wish to change module(s) after registration, he/she must complete the official "Change of Subject/Module" form and submit to Head of Department for approval.

## 6. Registration Process

### a. General

- Students will register online on the UP portal.
- Before a student will be able to register, a contract needs to be concluded between the student and the University of Pretoria. Students must access the contract online on the UP Portal, Student Centre, at <http://www.upnet.up.ac.za/>.
- The student's registration must be renewed annually until 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 recommenced.
- Online registrations take place in the beginning of the year.
- A student can only register after he/she has been admitted to the programme and their registration fees has been paid.
- International students need to ensure that their study permits are valid before registration.

### b. Problems with online registrations

If a student experience problems with the online registration system, he/she should contact the relevant person, see [Administrative contact information](#), at the EBIT Student Administration at Engineering Building I, level 6. Examples of such problems are:

- If the student submitted a late application, he/she may not be able to register online.
- The online registration closes at some point in time in the first quarter. After that time, the Student Administrator will assist the student if he/she still needs to register.

### c. Student Cards

After registration you will be able to print a proof of registration on the UP Portal. You need to present your proof of registration at the Client Service Centre (CSC) on campus (at some convenient time) to have your student card issued. You will need your student card to enter the campus and access the library. It is essentially your campus ID and you should have it with you at all times when on campus.

## 7. Program and Module Information

The following modules are offered in the various programs. Students should be aware that even if a module is listed, only those modules, for which there is sufficient demand, will be offered each year. Students must also confirm during registration that the modules are being offered and in which semester. NO semester changes will be accommodated.

**It remains the student's responsibility to confirm presentation schedule of selected modules at the relevant department offering the chosen modules.**

### a. BEng (Hons) (Mining Engineering) (12240072) (128 credits)

Each module offered at Honours level is assigned a number of SAQA credits. Approximately 10 hours of study are required per SAQA credit. 128 SAQA credits need to be obtained to complete the Honours degree. All subjects lean towards distance learning, but compulsory contact sessions could be scheduled if and where necessary per module. These sessions will be communicated timeously.

A minimum of 32 credits should be accumulated per year and the programme should be completed within two years. For the BEng Hons plan, a student is allowed to take 4 modules that have a 16 credit bearing, from another engineering discipline, subjected to the department's approval. Refer to the individual departments' post-graduate brochures or contact that department directly. At least 50% of the 128 credits must be taken at the Mining department with PSS700 as mandatory.

Year Module	Code	Credits
Research Project 700	PSS 700	32 [C]
<b>Semester 1 Module</b>		
Airflow & Fans	PKB 711	16 [E]
Financial Mine Valuation	PFZ 780	16 [E]
Advanced Mine Design	PMZ 780	16 [E]
Strata Control: Hard rock	PSZ 786	16 [E]
	<b>Code</b>	<b>Credits</b>
<b>Semester 2 Module</b>		
Advanced Explosives Engineering	PRX 785	16 [E]
Open-pit Mining	POY 783	16 [E]
Heating & Cooling	PKB 712	16 [E]
Slope Stability – provisionally	PHS 781	16 [E]

[C]: Modules are Core / Compulsory

[E]: Modules are Elective

## MODULE DESCRIPTIONS

### *Research Project – PSS700*

---

The general objective with this module is to develop the student's research skills and documentation thereof. In this it is expected that the student will identify a project or potential research topic within his/her immediate working environment and apply all the necessary engineering and other acquired skills to solve the problem or conclude the research topic identified. It is therefore expected of the students to identify a project or research topic that can and will have immediate implementation value for his/her organisation and therefore will also prove the feasibility of implementation during his/her oral examination pertaining to the investigation. The department will identify a suitable supervisor (also incorporating industry-knowledgeable members) to help and guide the student with the project. The subject is ultimately a self-study research based subject that is created, with the main objective to enhance your ability to perform a Masters and later a PhD investigation with much more ease. It is therefore also a requirement that the student will pursue the potential of a publication on the research findings/project implementation in a peer reviewed accredited journal as co-author with his immediate supervisor.

### *Financial Mine Evaluation – PFZ780*

---

An understanding of the factors impacting the profitability of the mining, like methodology, techniques and equipment is critically important for the efficient design and management of mines, so as to ensure sustainability and profitability. In the study of this module, skills are developed which will enable the learner to understand the fundamentals that govern the profitability of the reserve in conjunction with the design and operation of the mine. Firstly, from the point of view of resource and mining method selection and secondly, from the point of view of the impact of equipment utilized. The learner will be able to use the basic knowledge to assess, evaluate, synthesise and recommend profitable resources for mining, taking cognisance of the relevant status and laws impacting on the resource. The learner will also be able to recognise practical engineering-related mining problems and associated financial risk and propose suitable solutions derived from the application of this knowledge.

### *Advanced Mine Design – PMZ780*

---

The general objective with this module is to emphasise on problem solving and understanding rather than memorising, in order to stimulate creative thinking and the development of innovative skills amongst students in the field of materials science and materials engineering. A problem-driven approach to learning is followed. Student-centered and co-operative learning methods are applied develop the above skills, as well as to stimulate the development of communication skills, interpersonal skills.

### *Strata Control: Hard Rock – PSZ786*

---

This module concentrates on the tabular orebodies that occur in South Africa, with particular emphasis on the gold-bearing orebodies in the Witwatersrand Basin and platinum bodies of the Bushveld-complex. It addresses in-situ stresses in rock masses, and their measurement, the occurrence of mining induced seismicity, seismic source parameters, ground deformation, seismology and rockbursts, rockburst control and prediction, stability pillars, and the theoretical determination of seismic potential for mine design. Therefore, mining layouts and support strategies are covered, investigative techniques and considerations of surface effects.

### *Advanced Explosives Engineering – PRX785*

---

This module concentrates on the in particular on blasting engineering. The basic knowledge of explosive engineering is applied to solve industry concerns and problems. An understanding of explosives engineering is essential for the mining engineer. An understanding of the factors impacting drilling, explosives, techniques and equipment is critically important for the efficient blast and management of mining operations, so as to ensure sustainability and profitability.

### *Open-pit Mining – POY783*

---

An understanding of surface mining methods, techniques and equipment is critically important for the safe and efficient design and management of mines. In the study of this module, skills are developed which will enable the learner to understand the fundamentals that govern the design and operation of surface mines. Firstly, from the point of view of method selection and secondly, from the point of view of equipment selection and management. The learner will be able to use the basic knowledge to evaluate, synthesize, design and recommend suitable mining and equipment systems for mines, and to therefore be able to recognize practical engineering-related mining problems and propose suitable solutions derived from the application of this knowledge.

---



### b. BSc (Applied Science) (12243035) (128 credits)

A minimum of 32 credits should be accumulated per year and the programme should be completed within two years. Only Mining Engineering modules may be taken for this plan.

Year Module	Code	Credits
Research Project 700	PSS 700	32 [C]
Underground Mining Methods	PMY 701	32 [C]
<b>Semester 1 Module</b>		
Explosive Engineering	PRX 701	16 [C]
Surface Mining	PMY 703	16 [C]
<b>Semester 2 Module</b>		
Basic Mine Ventilation Engineering	PKB 701	16 [C]
Basic Rock Mechanics	PSZ 703	16 [C]

[C]: All Modules are Core / Compulsory

## MODULE DESCRIPTIONS

### *Research Project – PSS700*

The general objective with this module is to develop the student's research skills and documentation thereof. In this it is expected that the student will identify a project or potential research topic within his/her immediate working environment and apply all the necessary engineering and other acquired skills to solve the problem or conclude the research topic identified. It is therefore expected of the students to identify a project or research topic that can and will have immediate implementation value for his/her organisation and therefore will also prove the feasibility of implementation during his/her oral examination pertaining to the investigation. The department will identify a suitable supervisor (also incorporating industry-knowledgeable members) to help and guide the student with the project. The subject is ultimately a self-study research based subject that is created, with the main objective to enhance your ability to perform a Masters and later a PhD investigation with much more ease. It is therefore also a requirement that the student will pursue the potential of a publication on the research findings/project implementation in a peer-reviewed accredited journal as co-author with his immediate supervisor.

### *Underground Mining Methods – PMY701*

In the study of this module, skills are developed which will enable the learner to understand the fundamentals that govern the profitability of the reserve in conjunction with the design and operation of the mine. Firstly from the point of view of resource and mining method selection and secondly, from the point of view of the impact of equipment utilized. The learner will be able to use the basic knowledge to assess, evaluate, synthesise and recommend profitable resources for mining, taking cognisance of the relevant status and laws impacting on the resource.

### *Explosives Engineering – PRX701*

---

In the study of this module, skills are developed which will enable the learner to understand the fundamentals that govern the fragmentation of rock in conjunction with the design and operation of the mine. Firstly from a point of view of drilling and rock cutting method selection and secondly, from the point of view of the impact of explosives used to break the rock. The student will be able to use the basic knowledge assess, evaluate, synthesise and recommend blast design, taking cognisance of the relevant laws impacting on the use of explosives. The student will also be able to recognise practical engineering-related mining problems and associated drill and blast and propose suitable solutions derived from the application of this knowledge.

### *Surface Mining – PMY703*

---

Firstly from the point of view of method selection and secondly, from the point of view of equipment selection and management. The learner will be able to use the basic knowledge to evaluate, synthesize, design and recommend suitable mining and equipment systems for mines, and to therefore be able to recognize practical engineering-related mining problems and propose suitable solutions derived from the application of this knowledge.

### *Basic Mine Ventilation Engineering – PKB701*

---

Mine ventilation methods; primary and secondary ventilation methods, ventilation strategies for coal and hard rock mining environments including base metal mines. Mine development ventilation methods, mine air control, different types of fans including fan performances and air dilution calculations. Refrigeration: Elementary refrigeration principles, including concepts and methods, chilled water systems, including cooling distribution methods. Elementary mine ventilation planning, basic planning parameters and elementary mine ventilation economics and the impact of incorrect design and applications on safety and health. Mine gases, their origin and gas/coal dust explosions. Aspects of the Mine Health and Safety act are also dealt with.

### *Basic Rock Mechanics – PSZ703*

---

An understanding of rock behaviour and stress influences on the rock mass is essential for the mining engineer and it is required to have a basic knowledge of rock mechanics in order to design a safe working environment. The student will be able to use the basic knowledge to evaluate, synthesize, design and recommend suitable mining layouts and support systems for underground mines, and to therefore be able to recognize practical engineering-related strata control problems and propose suitable solutions derived from the application of this knowledge. As in all the engineering disciplines, CAD software packages are part of the skills base of the Rock Engineer. During this module, you will also have the opportunity to be introduced to numerical modelling codes used in industry to gain insight into the day-to-day task of the typical underground Rock Engineer.

---

**c. MEng (Mining Engineering) (12250072) (180 credits)**

PYI 890 - Minimum duration of study is 1 year and a total credits of 180

Unless the Dean, on recommendation of the relevant head of department, decides otherwise, the master's degree is conferred on the basis of a dissertation (including, where applicable, an examination on the dissertation).

Recognition is not granted for credits acquired during studying for the BEngHons or the BScHons.

**d. MSc (Applied Science) (12253072) (180 credits)**

PYI 890 - Minimum duration of study is 1 year and a total credits of 180

The MSc (Applied Science) degree is conferred by the same departments as the BScHons (Applied Science) degree. A minimum of 128 credits is required to obtain the MSc degree. Either a mini-dissertation (64 credits) and coursework (64 credits) or a dissertation (128 credits) is included in the programme.

Unless the Dean, on recommendation of the relevant head of department, decides otherwise, the master's degree is conferred on the basis of examinations of coursework and a mini-dissertation or a dissertation (including an examination on the dissertation).

---

**e. PhD Eng (Mining Engineering) (12263062) (360 credits)**

MYI 890 - Minimum duration of study is 2 years and a total credits of 360. Subject to the stipulations of the General Regulations, no candidate is admitted to doctoral studies unless such a candidate holds a master's degree in Engineering or an equivalent master's degree.

Unless otherwise decided by the Dean, on the recommendation of the supervisor, the PhD (Engineering) degree is awarded on the basis of a thesis and an examination on the thesis.

Unless Senate, on the recommendation of the supervisor, decides otherwise, a student, before or on submission of a thesis, must submit proof of submission of an article from/issued by an accredited journal, to the Head: Student Administration. The submitted article should be based on the research that the student has conducted for the thesis and be approved by the supervisor if the supervisor is not a co-author. The supervisor shall be responsible for ensuring that the paper is taken through all the processes of revision and resubmission, as may be necessary. Conferment of the degree may be made subject to compliance with the stipulations of this regulation.

The student must provide proof by means of his work, thesis and examination of advanced original research and/or creative work which makes a real and substantial contribution to the knowledge of engineering science and/or practice.

**f. PhD (Mining) (12263192) (360 credits)**

MYL 990 - Minimum duration of study is 2 years and a total credits of 360. Subject to the stipulations of the General Regulations, a master's degree is required for admission to studies for a PhD.

Unless otherwise decided by the Dean, on the recommendation of the supervisor, the PhD degree is awarded on the basis of a thesis and an examination on the thesis.

Unless the Senate, on the recommendation of the supervisor, decides otherwise, a student, before or on submission of a thesis, must submit proof of submission of an article issued by an accredited journal, to the Head: Student Administration. The submitted article should be based on the research that the student has conducted for the thesis and be approved by the supervisor if the supervisor is not a co-author. The supervisor shall be responsible for ensuring that the paper is taken through all the processes of revision and resubmission, as may be necessary. Conferment of the degree may be made subject to compliance with the stipulations of this regulation.

The student must provide proof by means of his work, thesis and examination of advanced original research and/or creative work which makes a real and substantial contribution to the knowledge of Engineering Science and/or Practice.

---

Follow us on:



**#UPMiningMatters**