

BOOKLET 2017 FOR 2018 - FACULTY OF ENGINEERING & TECHNOLOGY

Department: Process Control and Computer Systems

Faculty: Engineering and Technology

Diploma: Engineering Electrical, B Tech: Engineering Electrical,

M Tech: Engineering Electrical MEng: Engineering Electrical and D Tech: Engineering Electrical

1. Diploma in Computer Systems

Offered as full time contact class for five semesters followed by one semester Work Integrated Learning (carried out through attachment to Industry). The student is encouraged to look for suitable Industry opportunities (Company).

2. Admission Requirements

Subjects	Diploma	
NSC Endorsements	Eligibility for Dip or B Tech Degree	
Compulsory Subjects	Note	
		³ 3 = 40-49%
Mathematics	4	⁴ 4 = 50-59%
Physical Science	4	⁵ 5 = 60-69%
English	4	⁶ 6 = 70-79%
Total	3 x 4 = 12	⁷ 7 = 80-89%
		⁸ 8 = 90-99%
Any other 4 subjects with a minimum of 3	4 X 3 = 12	
Total	24	

Applicants with a National Certificate (Vocational) at NQF Level 4

National Certificate (Vocational)	Compulsory Subjects	Minimum	APS	%
				3 = 40 – 49%
	English		4	4 = 50 – 59%
	Mathematics		4	5 = 60 – 69 %
	Physical Sciences/ Applied Engineering Technology		4	6 = 70 – 79 %
	Any other three vocational subjects		5 x 3	7 = 80 – 89 %
	<i>Total</i>		27	8 = 90 – 100%

Applicants with a Senior Certificate

SC	Senior	Compulsory Subjects	Minimum	
National Certificate		English	4	3 = 40 – 49%
		Mathematics	4	4 = 50 – 59%
		Physical Science	4	5 = 60 – 69 %
		Any THREE other subjects excluding Life Orientation		6 = 70 – 79 %
		<i>Total</i>	3 X3 = 09	7 = 80 – 89 %
			21	8 = 90 – 100%

All other equivalent qualifications/certificates will be treated ad hoc.

Note: Scholars who do not qualify for the Diploma Programmes may apply for the pre diploma programmes. Tel: (016) 950-9589. For details on the pre diploma programmes see VUT website www.vut.ac.za.

3. Diploma Programme Structure – Computer Systems

Semester 1: Applied Communications Skills 1.1, Engineering Chemistry 1, Engineering Skills 1, ICT Skills I, Mathematics 1, Physics 1, Social Intelligence 1. Semester 2: Applied Communications Skills 1.2, Computing Applications 2, Digital Systems 1, Electrical Engineering 1, Mathematics 2, Physics 2, Safety Principles and Law 1.

Semester 3: Applied Communication Skills 2.1., Digital Systems 2, Electrical Engineering 2, Engineering programming 1, IT Essential 1, Networks 1, Software Engineering 1, Statistics 1.1.

Semester 4: Applied Communications 2.2, Electronics 1, Engineering programming 2, Mathematics 3, Networks 2 Operating Systems 1, Software Engineering 2,

Semester 5: Digital Communication 2, Digital Systems 3, Electronics 2, Engineering programming 3, Networks 3, Operating Systems 2,

Semester 6: Work Integrated Learning, Digital Systems 4, Electronics 3, Engineering programming 4, Engineering project 4 (WIL), Networks 4, Operating Systems 3, Software Engineering 3.

4. **Baccalaureus Technologiae (B Tech) - Admission requirements**

All applicants must have a Diploma or National Diploma with the proviso of a 60% performance in those diploma subjects that will carry forward into the B Tech qualification, including 12 months, Work Integrated Learning.

Compulsory Offerings: Industrial Project IV, Hardware Design IV, Functional Management, Database Programming IV, New Technology Programming IV.

Electives: (Choose any four from :) Software Systems IV, Database Administration IV, Mathematics IV, Network Systems IV, or two from another relevant discipline.

5. **Magister Technologiae (MTech)**

ADMISSION REQUIREMENTS: A minimum average of 60% must be achieved in Baccalaureus Technologiae. All students are required to attend a Programme in research methodology PROGRAMME DURATION: Minimum formal time is one year PROGRAMME STRUCTURE: A dissertation.

Masters of Engineering in Engineering (MEng Electrical)

Admission requirements: a BEng Degree or Equivalent level 8 qualification including the Postgraduate Diploma

Duration of Programme: The equivalent of 1 year full-time study.

Programme Structure: This instructional programme comprises of a thesis only.

6. **Doctor of Engineering in Electrical Engineering: (DEng Electrical)**

Admission requirements:

Magister Technologiae: Engineering: Electrical Engineering or equivalent

Ad hoc cases will be treated on merit.

Duration of the programme: At least two years full time research, concluded with a Doctoral Thesis

7. **Typical work environment for the Computer Technician**

Hardware design and development using microcontroller systems. Data communications, design, installation and maintenance of network systems. Programming and data processing. Database applications. Design and development of fully engineered systems.

8. **Career opportunities**

The computerization of most facets of modern business and industry, together with the great demand for technical manpower creates a multitude of possibilities.

9. **Career Status**

The Technician can register for professional status with ECSA, the Control Board for Engineering Technicians.

10. **Enquiries**

Enquiries may be addressed to:

Head of Department: Process Control and Computer Systems, Faculty of Engineering and Technology, Vaal University of Technology, Private Bag X021 Vanderbijlpark 1900 Tel: (016)950-9323; Fax (016)950-9727. E-mail: refilwem1@vut.ac.za website: www.vut.ac.za

Whilst every effort has been made to present the relevant information in this brochure, programme offerings may be subject to change in order to keep abreast with new developments in the higher education landscape. The institution therefore reserves the right to unilaterally change or amend any of the content/structures contained herein.

Process Control

1. **Diploma in Process Control**

Offered as full time contact class for four semesters (two years) followed by one year Work Integrated Learning (carried out through attachment to Industry). The student is encouraged to look for suitable Industry opportunities (Company).

2. **Programme Structure**

Semester 1: ICT Skills I, EDL, Process Instrumentation I, Physics 1, Electrical Engineering 1, Mathematics 1, Applied Communication Skills 1.1.

Semester 2: Process Instrumentation II, Digital Systems I, Electrical Engineering II, Electronics I, Mathematics II, Applied Communication Skills 1.2.

Semester 3: Process Instrumentation III, Digital System II, Control Systems II, Electronics II, *Mathematics III, Applied Communication Skills 2.1.

Semester 4: Design Project III, *Electronic Measurements III, Digital Systems III,

*Network Systems 2.1, *Electronics III, Applied Communication Skills 2.2

Electives: * Electives above can be replaced by Network Systems 2.2, Programming I, Programming II, Digital Process Control II, Digital Process Control III or another relevant engineering elective offering.

Semester 5/6: Experiential training.

3. **Baccalaureus Technologiae (B Tech) - Admission requirements**

All applicants must have a Diploma with the proviso of a 60% performance in those diploma subjects that will carry forward into the B Tech qualification, including a Work Integrated Learning component.

4. **Programme Structure**

Semester 1: Industrial Project IV, Process Instrumentation IV, Signal Processing IV, Digital Signal Processing IV, Electronics IV, Engineering Management IV, Database Programming IV.

Semester 2: Digital Control Systems IV, Circuit Analysis IV, Micro Systems Design IV, Network Systems IV, Software System IV.

5. Typical work environment for the Instrumentation Technician

Measurement and control of pressure, level, flow and temperature parameters. Design, installation and maintenance of process control systems. Calibration and optimisation of systems, industrial networks, Scada systems and Distributed Control Systems (DCS).

6. Career opportunities

The computerisation of modern instrumentation platforms in industry, and a vacuum period in training of mechanics and technicians in this modern environment led to a huge demand for technical manpower in this field.

7. Career Status

The Technician can register for professional status with ECSA, the Control Board for Engineering Technicians. The South African Institute for Measurement and Control is another professional body.

8. Enquiries

Enquiries may be addressed to:

The Head of Department: Process Control and Computer Systems, Faculty of Engineering

Vaal University of Technology, Private Bag X021 VANDERBIJLPARK 1900, Tel: (016) 950-9323; Fax: (016) 950-9727 e-mail: marcelo@vut.ac.za, website: www.vut.ac.za

Whilst every effort has been made to present the relevant information in this brochure, programme offerings may be subject to change in order to keep abreast with new developments in the higher education landscape. The institution therefore reserves the right to unilaterally change or amend any of the content/structures contained herein.

9. Magister Technologiae (M Tech)

Admission requirements: A minimum average of 60% must be achieved in Baccalaureus Technologiae. All students are required to attend a Programme in research methodology PROGRAMME DURATION: Minimum formal time is one year PROGRAMME STRUCTURE: A dissertation.

Masters of Engineering in Electrical Engineering (MEng Electrical)

Admission requirements: a BEng Degree or Equivalent level 8 qualification including the Postgraduate Diploma

Duration of Programme: The equivalent of 1 year full-time study.

Programme Structure: This instructional programme comprises of a thesis only.

10. Doctor of Engineering in Electrical Engineering: (DEng Electrical)

Admission requirements:

Magister Technologiae: Engineering: Electrical Engineering or equivalent

Ad hoc cases will be treated on merit.

Duration of the programme: At least two years full time research, concluded with a Doctoral Thesis

11. Enquiries

Enquiries may be addressed to:

The Head of Department: Process Control and Computer Systems, Faculty of Engineering

Vaal University of Technology, Private Bag X021 VANDERBIJLPARK 1900, Tel: (016) 950-9323; Fax: (016) 950-9254 e-mail: refilwem1@vut.ac.za, website: www.vut.ac.za

Whilst every effort has been made to present the relevant information in this brochure, programme offerings may be subject to change in order to keep abreast with new developments in the higher education landscape. The institution therefore reserves the right to unilaterally change or amend any of the content/structures contained herein.



Department: Electronic Engineering

Faculty: Engineering and Technology

Diploma: Engineering Electrical, B Tech: Engineering Electrical

M Tech: Engineering Electrical, MEng: Engineering Electrical and D Tech: Engineering Electrical

1. Minimum Admission Requirements

Subjects	Diploma	
NSC Endorsements	Eligibility for Dip or B Tech Degree	
Compulsory Subjects		Note
		* 3 = 40-49%
Mathematics	4	³ 4 = 50-59%
Physical Science	4	⁴ 5 = 60-69%
English	4	⁵ 6 = 70-79%
Total	3 x 4 = 12	⁶ 7 = 80-89%
		⁷ 8 = 90-99%
Any other 4 subjects with a minimum of 3	4 X 3 = 12	
Total	24	

Applicants with a National Certificate (Vocational) at NQF Level 4

National Certificate (Vocational)	<u>Compulsory Subjects</u>	<u>Minimum</u>	<u>APS</u>	<u>%</u>
				3 = 40 – 49%
	English		4	4 = 50 – 59%
	Mathematics		4	5 = 60 – 69 %
	Physical Sciences/ Applied Engineering Technology		4	6 = 70 – 79 %
	Any other three vocational subjects		5 x 3	7 = 80 – 89 %
	<i>Total</i>		27	8 = 90 – 100%

Applicants with a Senior Certificate

SC	<u>Compulsory Subjects</u>	<u>Minimum</u>	<u>%</u>
National Senior Certificate	English	4	3 = 40 – 49%
	Mathematics	4	4 = 50 – 59%
	Physical Science	4	5 = 60 – 69 %
	Any THREE other subjects excluding Life Orientation	3 X3 = 09	6 = 70 – 79 %
	<i>Total</i>		7 = 80 – 89 %
		21	8 = 90 – 100%

Diploma in Electronic Engineering

Offered as full time contact class for five semesters followed by Work Integrated Learning (carried out through attachment to Industry). The student is encouraged to look for suitable Industry opportunities (Company).

Note: Scholars who do not qualify for the Diploma Programmes may apply for the pre diploma programmes. Tel: (016) 950-9589. For details on the pre diploma programmes see VUT website www.vut.ac.za

2. Programme Structure

(*Compulsory Subjects, plus twelve selected subjects)

Semester 1: *Applied Communication Skills 1.1, *Engineering Skills 1, *ICT Skills 1, *Mathematics 1, *Social Intelligence 1, Engineering Chemistry 1, Physics 1.

Semester 2: *Applied Communication Skills 1.2, *Computing Applications 2, *Electrical Engineering 1, *Mathematics 2, *Safety Principles and Law 1, Digital Systems 1, Physics 2.

Semester 3: *Applied Communication Skills 2.1, *Electrical Engineering 2, *Electronics 1, *Projects 1 (WIL Electrical), Digital Systems 2, Engineering Programming 1, Management 1, Networks 1, Process Instrumentation 1.

Semester 4: *Applied Communication Skills 2.2, *Electronics 2, *Projects 2 (WIL Electrical), Digital Systems 3, Electrical Computer Aided Design 1, Electronic Communication 2, Engineering Programming 2, Mathematics 4.

Semester 5: *Mathematics 3, *Projects 3 (WIL Electrical), Control Systems 2, Digital Communication 2, Electrical Computer Aided Design 2, Electronics 3, Measurement Technology 3, Opto-Electronics 3, Satellite Communication 3.

Semester 6: * *Engineering Project 4 (WIL), *Projects 4 (WIL Electrical), Digital Systems 4, Electronics 4, Entrepreneurship 1, Experiential Learning 1 (Electrical), Experiential Learning 2 (Electrical), Microwave Communication 3, Radio Engineering 3, Transmission 3.

2.1 Experiential Training

A candidate must do at least 60 credits in-service training at a university-approved employer.

This is necessary to give the student practical experience in the work situation.

The Department of Co-operative Education will assist in WIL administration and placements. Contact details: Tel: 016-950-9496, Fax: 016-950-9759, E-mail: education@vut.ac.za.

2.2 Future Studies

The Diploma can be followed by a further year of full time study to obtain the B Tech degree. The candidate can then register as a Professional / Technician / Technologist with ECSA. A Masters (M Tech) and Doctoral (D Tech) degree can also be obtained by means of research.

2.3 Baccalaureus Technologiae (B Tech)

The admission requirements are: An appropriate National Diploma or National Higher Diploma or equivalent qualification.

2.4 Programme Structure

Semester 1 : Electronics IV, Radio Engineering IV, *Industrial Project IV, Measurement Technology IV.

Semester 2 : Microwave Engineering IV, Industrial Project IV, Satellite Communication IV, Opto Electronics IV.

2.5 Additional Subjects

Semester 1: Engineering Management IV, Digital Signal Processing IV, Signal Processing IV.

Semester 2: Engineering Mathematics IV, Power Electronics IV, Digital Signal Processing IV, Circuit Analysis IV, Digital Control Systems IV.

3. What are the functions of an Electronic Communications Technician?

The technician will be involved with the practical design, installation and maintenance of electronic equipment.

The calibration of measuring instruments may also form part of the technician's task. In the engineering team the technician forms part of the management team.

Modern satellite communication, digital television, radio engineering and telecommunication, make electronic communication one of the fastest growing industries.

3.1 Registration with ECSA

The Diploma and B Tech degree are recognized as qualifying prerequisites for registration with the Engineering Council of South Africa (ECSA):

Qualification	Possible registration
Diploma	Registered Engineering

a. Baccalaureus Technologiae (B Tech) - Admission requirements

All applicants must have a Diploma with the proviso of a 60% performance in those diploma subjects that will carry forward into the B Tech qualification, including 12 months Work Integrated Learning.

Apart from the prescribed qualification, a specified period of relevant post-qualification practical experience is a prerequisite for registration.

b. Magister Technologiae (M Tech)

Admission requirements: A minimum average of 60% must be achieved in Baccalaureus Technologiae. All students are required to attend a Programme in research methodology PROGRAMME DURATION: Minimum formal time is one year PROGRAMME STRUCTURE: A dissertation.

Masters of Engineering in Electrical Engineering (MEng Electrical)

Admission requirements: a BEng Degree or Equivalent level 8 qualification including the Postgraduate Diploma

Duration of Programme: The equivalent of 1 year full-time study.

Programme Structure: This instructional programme comprises of a thesis only.

2.6. Doctor of Engineering in Electrical Engineering: (DEng Electrical)

Admission requirements:

Magister Technologiae: Engineering: Electrical Engineering or equivalent

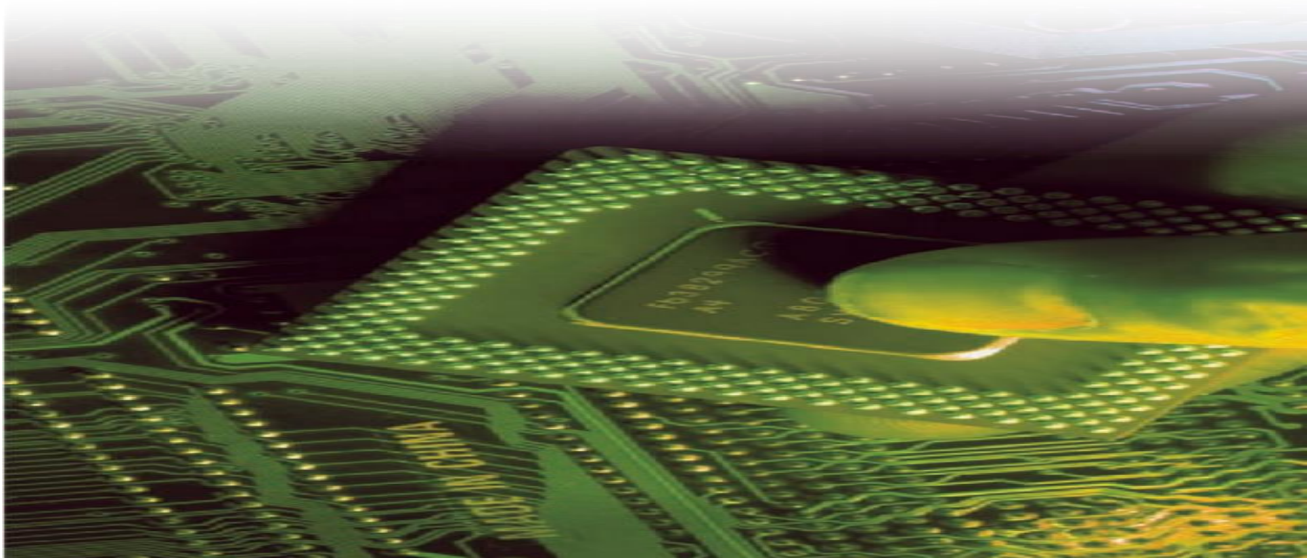
Ad hoc cases will be treated on merit.

Duration of the programme: At least two years full time research, concluded with a Doctoral Thesis

2.7. Enquiries

Enquiries may be addressed to:

The Head of Department: Electronic Engineering



Department: Power Engineering

Faculty: Engineering and Technology

Diploma: **Engineering Electrical, B Tech: Engineering Electrical**

M Tech: Engineering Electrical, MEng: Engineering Electrical and D Tech: Engineering Electrical

1. Admission Requirements:

Subjects	Diploma	
NSC Endorsements	Eligibility for Dip or B Tech Degree	
Compulsory Subjects		Note
Mathematics	4	* 3 = 40-49%
Physical Science	4	* 4 = 50-59%
English	4	³ 5 = 60-69%
Total	3 x 4 = 12	⁴ 6 = 70-79%
Any other 4 subjects with a minimum of 3	4 X 3 = 12	⁵ 7 = 80-89%
Total	24	⁶ 8 = 90-99%

Applicants with a National Certificate (Vocational) at NQF Level 4

National Certificate (Vocational)	Compulsory Subjects	Minimum	APS	%
				3 = 40 – 49%
	English		4	4 = 50 – 59%
	Mathematics		4	5 = 60 – 69 %
	Physical Sciences/ Applied Engineering Technology		4	6 = 70 – 79 %
	Any other three vocational subjects		5 x 3	7 = 80 – 89 %
	<i>Total</i>		27	8 = 90 – 100%

Applicants with a Senior Certificate

SC		Compulsory Subjects	Minimum	
National Certificate	Senior	English	4	3 = 40 – 49%
		Mathematics	4	4 = 50 – 59%
		Physical Science	4	5 = 60 – 69 %
		Any THREE other subjects excluding Life Orientation	3 X3 = 09	6 = 70 – 79%
		<i>Total</i>		7 = 80 – 89 %
			21	8 = 90 – 100 %

Note: Scholars who do not qualify for the Diploma Programmes may apply for the pre diploma programmes. Tel: (016) 950-9589. For details on the pre diploma programmes see VUT website www.vut.ac.za

2. Compulsory Subjects

Semester 1: *Applied Communication Skills 1.1, *Engineering Skills 1, *ICT Skills 1, *Mathematics 1, *Social Intelligence 1, Engineering Drawing 1, Physics .

Semester 2: *Applied Communication Skills 1.2, *Computing Applications 2, *Electrical Engineering 1, *Mathematics 2, *Safety Principles and Law 1, Digital Systems 1.

Semester 3: *Applied Communication Skills 2.1, *Electrical Engineering 2, *Electronics 1, *Projects 1 (WIL Electrical), Digital Systems 2, Management 1, Process Instrumentation 1.

Semester 4: *Applied Communication Skills 2.2, *Electronics 2, *Projects 2 (WIL Electrical), Digital Systems 3, Electrical Computer Aided Design 1, Electrical Engineering 3, Electrical Machines 2, Electrical Protection 3, Heat Flow 2, Mathematics 3, Power Systems 2.

Semester 5: *Mathematics 4, *Projects 3 (WIL Electrical), Control Systems 2, Electrical Computer Aided Design 2, Electrical Machines 3, Energy Management 3, Measurement Technology 3, Power Conversion 2, Power Electronics 3, Power Systems 3.

Semester 6: *Engineering Project 4 (WIL), *Projects 4 (WIL Electrical), Electrical Distribution 3, Electrical Engineering 4, Electrical Machines 4, Electrical Protection 4, Electronics 4, Energy Management 4, Entrepreneurship 1, Experiential Learning 1 (Electrical), Experiential Learning 2 (Electrical), Power Electronics 4, Transmission 3.

2.1 Work Integrated Learning (WIL)

A candidate must do at least 60 credits in-service training at a university-approved employer.

This is necessary to give the student practical experience in the work situation.

The Department of Co-operative Education will assist in WIL administration and placements. Contact details: Tel: 016-950-9496, Fax: 016-950-9759, E-mail: education@vut.ac.za.

2.2. Baccalaureus Technologiae (B Tech) - Admission requirements

All applicants must have a Diploma or National Diploma with an average of at least 60% for all credit learning academic subjects

2.3. Curriculum and Codes

Please Note: B Tech subjects are only offered once a year. Year marks in B Tech subjects may only be used once. The following subjects are compulsory:

Subject	Code	Credit
Semester 1:		
Electrical Machines IV*	EPMAC4	0,1
Protection Technology IV	EPRTT4	0,1
High Voltage Engineering IV	EPHIN4	0,1
Power Electronics IV	EAPOW4	0,1
Industrial Projects IV	EPIPR4	0,3
Semester 2:		
Engineering Mathematics IV AMISK4		0,1
Electrical Protection IV EPROT4		0,1
Power Systems IV EPDST4		0,1

3. What does a Power Engineering Technician/Technologist do?

Power Engineering consists of the following:

- Fundamentals of electrical engineering.
- Generation of power by means of conventional and alternative energy sources.
- Transmission and distribution of electrical power.
- Electrical Machines and Power Transformers.
- Electrical Protection and Power Electronics.

It can be seen from the above that Power Engineering forms an integral part of almost every industrial or household activity. There is a continuous demand for technicians and technologists in this field either from the electricity suppliers, mines, large industries, municipalities or small businesses.

Our diplomats and graduates are equipped with the knowledge, drive and initiative to play a leading role in securing a healthy future in this country through the field of Power Engineering.

In the engineering team, Power Engineering reflects a dynamic and changing environment. It is practiced by people who are critical, inquisitive and creative. If you are such a person - then this Programme is just for you!

4. Career Opportunities

- 4.1 Technician (Diploma - 3 years): Maintenance, development work, projects at places like Eskom, Mines, Municipalities, Sasol, etc. This person can register as Professional Technician with the Engineering Council of South Africa (ECSA).
- 4.2 Technologist (B Tech - 4 years): Higher level of proficiency with special emphasis on technology transfer and application, complex problem solving abilities, analytical thinking and greater technical and managerial skills. This person can register as Professional Technologist with ECSA. For any further information regarding B Tech, please contact the Department of Power Engineering directly.
- 4.3 **Magister Technologiae (M Tech)**
Admission requirements: A minimum average of 60% must be achieved in Baccalaureus Technologiae. All students are required to attend a Programme in research methodology PROGRAMME DURATION: Minimum formal time is one year PROGRAMME STRUCTURE: A dissertation.

Masters of Engineering in Electrical Engineering (MEng Electrical)

Admission requirements: a BEng Degree or Equivalent level 8 qualification including the Postgraduate Diploma
Duration of Programme: The equivalent of 1 year full-time study.
Programme Structure: This instructional programme comprises of a thesis only.

4.4. Doctor of Engineering in Electrical Engineering: (DEng Electrical)

Admission requirements:
Magister Technologiae: Engineering: Electrical Engineering or equivalent
Ad hoc cases will be treated on merit.
Duration of the programme: At least two years full time research, concluded with a Doctoral Thesis

Government Certificate of Competence: This field of study will allow the student entrance to the National Examination after proof of relevant experience. Subjects required for entrance to the National Examination are listed as follows:

Digital Systems 1	Electrical Engineering 1
Electronics 1	Communication Skills 1A
Computer Skills 1	Mathematics 1B
Industrial Electronics II	Electrical Engineering II
Electrical Machines II	Electronics II
Mathematics IIA	Power Electronics III
Electrical Protection III	Electrical Engineering III
Electrical Machines III	Electrical Distribution III
Design Project III	Mechanical Engineering Drawings 1
Mechanics 1,	Strength of Materials II
Strength of Materials III	Mechanical Technology 1
Mechanical Technology II	Mechanical Technology III

5. Enquiries

Enquiries may be addressed to:
Head of Department Power Engineering: Faculty of Engineering
Vaal University of Technology
Private Bag X021 Vanderbijlpark 1900
Tel: (016) 950-9295 or 950-9908; Fax: (016) 950-9795; e-mail: rosemaryk@vut.ac.za website: www.vut.ac.za



Department: Chemical Engineering

Faculty: Engineering and Technology

Diploma: Engineering Chemical,

B Tech: Engineering Chemical, M Tech: Engineering Chemical, MEng Engineering Chemical and PhD: Engineering Chemical

1. Minimum Admission Requirements:

Subjects	Diploma	
NSC Endorsements	Eligibility for Dip or B Tech Degree	
Compulsory Subjects	Note	
		* 3 = 40-49%
Mathematics	4	* 4 = 50-59%
Physical Science	4	* 5 = 60-69%
English	4	* 6 = 70-79%
Total	3 x 4 = 12	* 7 = 80-89%
		* 8 = 90-99%
Any other 4 subjects with a minimum of 3	4 X 3 = 12	
Total	24	

Applicants with a National Certificate (Vocational) at NQF Level 4

National Certificate (Vocational)	Compulsory Subjects	Minimum	APS	%
				3 = 40 – 49%
	English		4	4 = 50 – 59%
	Mathematics		4	5 = 60 – 69 %
	Physical Sciences/ Applied Engineering Technology		4	6 = 70 – 79 %
	Any other three vocational subjects		5 x 3	7 = 80 – 89 %
				8 = 90 – 100%
	<i>Total</i>		27	

Applicants with a Senior Certificate

SC	Senior	Compulsory Subjects	Minimum	
National Certificate		English	4	3 = 40 – 49%
		Mathematics	4	4 = 50 – 59%
		Physical Science	4	5 = 60 – 69 %
		Any THREE other subjects excluding Life Orientation		6 = 70 – 79 %
			3 X3 = 09	7 = 80 – 89 %
		<i>Total</i>		8 = 90 – 100 %
			21	

Note: Applicants who do not qualify for the Diploma Programmes may apply for the extended diploma programmes. Tel: (016) 950-9589. For details on the pre diploma programmes see VUT website www.vut.ac.za

Note: Any candidate not meeting the standard minimum required but with total points of 24 can be placed on waiting list into Engineering Extended Programme including Foundation.

2. Curriculum

2.1. Diploma: in Chemical Engineering: Chemical All subjects are compulsory.

Semester 1: Applied Communications Skills 1.1, Engineering Chemistry 1, Engineering Skills 1, ICT Skills I, Mathematics 1, Physics 1, Social Intelligence 1. Semester 2: Applied Communications Skills 1.2, Computing Applications 2, Engineering Chemistry 2, Engineering Drawing 1, Introduction to Chemical Engineering 1, Mathematics 2, Physics 2, Safety Principles and Law 1.

Semester 3: Applied Communication 2.1, Chemical Engineering Laboratory 1, Chemical Process Industries 1, Engineering Chemistry 3, Material and Energy balance 2, Mathematics 3, Mechanical Operation 1.

Semester 4: Applied Communication Skills 2.2, Chemical Engineering Laboratory 2, Chemical Engineering Thermodynamics 1, Heat and Mass Transfer 1, Process Control 1, Process Fluid Dynamics 1.

Semester 5: Applied Thermodynamics 2, Chemical Process Design, Environmental Engineering 1, Management 1, Reactor Technology 1, Separation Processes 1.

Semester 6: Experiential Learning 1 (Chemical)

2.2. Baccalaureus Technologiae (B Tech)- Admission requirements:

All applicants must have a Diploma or National Diploma with the proviso of a 60% performance in those diploma subjects that will carry forward into the B Tech qualification, including 12 months, work integrated learning.

Duration of Programme: A degree will be awarded after the successful completion of 10 subjects. The Programme is offered full time, minimum of 1 year..

Programme Structure: All subjects are compulsory

Fluid Flow IV, Process Control IV, Equipment Design IV, Production Engineering: Chemical Industry IV, Project: Chemical Engineering IV, Heat and Mass Transfer IV, Unit Operations IV, Reactor Technology IV, Plant Design IV, Mathematics: Chemical Engineering III.

2.3. Magister Technologiae: Engineering: Chemical Admission requirements:

B Tech: Engineering: Chemical or equivalent. This degree is based on research only.

Duration of Programme: The equivalent of 1 year full-time study.

Programme Structure: This instructional programme comprises of a thesis only.

2.4. Masters of Engineering in Chemical Engineering

Admission requirements: a BEng Degree, BSc Degree in Chemical Engineering or Equivalent level 8 qualification including the Postgraduate Diploma

Duration of Programme: The equivalent of 1 year full-time study.

Programme Structure: This instructional programme comprises of a thesis only.

2.5. PhD Engineering: Chemical

Admission requirements:

Magister Technologiae: Engineering: Chemical or equivalent

Ad hoc cases will be treated on merit.

Duration of the programme: At least two years full time research, concluded with a Doctoral Thesis

3. What are the functions of a Chemical Engineering Technician?

The qualified Chemical engineer/technician may find himself/herself as a member of an engineering team which may consist of engineers, scientists, artisans, process personnel, technologists and technicians from other disciplines. Functions may include the commissioning and maintenance of chemical plants, process control, design and development, optimizing of chemical processes, quality control over the products of the manufacturing processes, feasibility studies and a variety of tasks related to the chemical process industry.

4. Career Opportunities

A profession in the field of chemical engineering offers a challenging and exciting career in both the private and public sectors. There is a continuous demand for trained manpower in the field of chemical engineering. Job designations may vary from production foremen, area superintendents plant engineer and various others within several branches of heavy, light and general types of industries where the services and expertise of such persons are required.

5. Enquiries may be addressed to:

Head of Department Chemical Engineering: Faculty of Engineering

Vaal University of Technology

Private Bag X021 Vanderbijlpark 1900

Tel: (016) 950-9243or 950-9884; Fax: (016) 950-9796; e-mail: rethav@vut.ac.za website: www.vut.ac.za



Department: Civil Engineering and Building

Faculty: Engineering and Technology

Diploma: Engineering: Civil, B Tech: Engineering Civil,

M Tech: Engineering Civil, MEng: Engineering Civil and D Tech: Engineering Civil

Hierarchy of Qualifications

The Diploma is the first level of qualification, beyond that, the following qualification hierarchy exists.

Baccalaureus Technologiae (B Tech)

Advanced Diploma

Postgraduate Diploma

Magister Technologiae (M Tech)/ Masters of Engineering (MEng)

Doctor of Engineering in Civil Engineering (DEng)

1. Admission Requirements:

Subjects	Diploma	
NSC Endorsements	Eligibility for Dip or B Tech Degree	
Compulsory Subjects		Note
		* 3 = 40-49%
Mathematics	4	* 4 = 50-59%
Physical Science	4	* 5 = 60-69%
English	4	* 6 = 70-79%
Total	3 x 4 = 12	* 7 = 80-89%
		* 8 = 90-99%
Any other 4 subjects with a minimum of 3	4 X 3 = 12	
Total	24	

Applicants with a National Certificate (Vocational) at NQF Level 4

National Certificate (Vocational)	Compulsory Subjects	Minimum	APS	%
	English		4	4 = 50 – 59%
	Mathematics		4	5 = 60 – 69 %
				6 = 70 – 79 %
				7 = 80 – 89 %
	Physical Sciences/ Applied Engineering Technology		4	8 = 90 – 100%
	Any other three vocational subjects		5 x 3	
	Total		27	

Applicants with a Senior Certificate

SC	Senior	Compulsory Subjects	Minimum	3 = 40 – 49%
National Certificate				English
	Mathematics	4	5 = 60 – 69 %	
	Physical Science	4	6 = 70 – 79 %	
	Any THREE other subjects excluding Life Orientation	3 X3 = 09	7 = 80 – 89 %	
	Total		8 = 90 – 100%	
		21		

Note: Scholars who do not qualify for the Diploma Programmes may apply for the Extended programmes. Tel: (016) 950-9589. For details on the pre diploma programmes see VUT website www.vut.ac.za

2. Programme Structure of the Diploma

This is a 3 year Programme and consists of:

Five semester university attendance followed by one semester experiential training in industry.

2.1 University Attendance

All the subjects are compulsory.

Semester 1: Applied Communications Skills 1.1, Engineering Chemistry 1, Engineering Skills 1, ICT Skills I, Mathematics 1, Physics 1, Social Intelligence 1.

Semester 2: Applied Communications Skills 1.2, Computing Applications 2, Applied Mechanics 1, Engineering Chemistry 2, Engineering Drawing 1, Mathematics 2, Physics 2, Safety Principles and Law 1.

Semester 3

Applied Communication Skills 2.1, Construction Materials 1, Construction Methods 1, Engineering Drawing 2, Engineering Geology 1, Engineering Survey 1, Soil Mechanics 1, Theory of Structures 2.

Semester 4

Applied Communication Skills 2.2, Civil Engineering Management 1, Construction Materials 2, Elements of Structural Steel and Timber Design, Engineering Survey 2, Structural Analysis 3, Transportation Engineering 1, Water Engineering 1.

Semester 5:

Civil Engineering Management 2, Documentation 1, Elements of Reinforced Concrete Masonry Design, Fluid Mechanics 2 (Civil) Soil Mechanics 2, Structural Analysis 4, Transportation Engineering 2.

Semester 6: Experiential Learning 1 (Civil)

Baccalaureus Technologiae (B Tech) - Admission requirements

All applicants must have a Diploma or National Diploma with the proviso of a 60% performance in those diploma subjects that will carry forward into the B Tech qualification, including Work Integrated Learning.

SPECIALISATION FIELDS: Transportation, Water, Structural, Urban Engineering.

PROGRAMME DURATION: It is offered by means of part-time classes. Two subjects per semester. This programme will therefore take a minimum of two years to complete. ENTRANCE REQUIREMENT: National Diploma: Engineering: Civil.

ADDITIONAL CONDITIONS:

For candidates applying for admission into the Programme B Tech: Engineering: Civil (Transportation Engineering), the following conditions shall also apply:

Apart from meeting the above requirements, a candidate must obtain a 60% aggregate in a combination of ANY FOUR of the following subjects at the National Diploma: Engineering: Civil level: Transportation Engineering 2 and 3, Geotechnical Engineering 2, Surveying 2 and Documentation 3.

For candidates applying for admission into the Programme B Tech: Engineering: Civil (Structural Engineering), the following conditions shall also apply:

Apart from meeting the above requirements, a candidate must obtain a 60% aggregate in a combination of ANY FOUR of the following subjects at the Diploma: Engineering: Civil level: Structural Analysis 2 and 3, Structural Steel and Timber Design 3, Theory of Structures 2, and Reinforced Concrete and Masonry Design .

For candidates applying for admission into the Programme B Tech: Engineering: Civil (Water Engineering), the following conditions shall also apply:

Apart from meeting the above requirements, a candidate must obtain a 60% aggregate in a combination of ANY FOUR of the following subjects at the Diploma: Engineering: Civil level: Applied Mechanics 1, Water Engineering 2 and 3, and Geotechnical Engineering 2 and 3.

For candidates applying for admission into the Programme B Tech: Engineering: Civil (Urban Engineering), the following conditions shall also apply:

Apart from meeting the above requirements, a candidate must obtain a 60% aggregate in a combination of ANY FOUR of the following subjects at the Diploma: Engineering: Civil level: Transportation Engineering 2 and 3, Water Engineering 2 and 3, and Documentation 3

NB: Candidates who do not meet the above requirements will need to apply through the RPL office by providing a portfolio of relevant post qualification work experience of not less than one year (excluding P1 and P2) in order to be considered for selection

It should be further noted that a submitted application does not guarantee entry into the Programme. Entry into the programme shall be based upon the applicant meeting the minimum entry requirements, the departmental/institutional Student Enrolment Plan (SEP) and availability of space.

All other equivalent qualifications will be treated ad hoc.

Magister Technologiae (M Tech: Engineering: Civil)

Entrance requirements: B Tech: Engineering: Civil or an NQF level 7 qualification in Civil Engineering (or related field) with an average of 60%. Holders of any other equivalent South African or foreign qualifications may also be considered based on the department's assessment of these qualifications and the candidate's suitability for admission into the programme. A SAQA evaluation certificate will be required to be submitted upon application for admission by candidates with foreign qualifications.

PROGRAMME DURATION: Minimum formal time is one year.

PROGRAMME STRUCTURE: This instructional programme comprises of a thesis only, provided that the learner has already passed an instructional offering in research methodology.

Masters of Engineering in Civil Engineering (MEng Civil)

Admission requirements: a BEng Degree or Equivalent level 8 qualification including the Postgraduate Diploma

Duration of Programme: The equivalent of 1 year full-time study.

Programme Structure: This instructional programme comprises of a thesis only.

Doctor of Engineering in Civil Engineering: (DEng Civil)

Admission requirements:

Magister Technologiae: Engineering: Civil or equivalent

Ad hoc cases will be treated on merit.

Duration of the programme: At least two years full time research, concluded with a Doctoral Thesis

2.2 General Information

Each semester consists of approximately 16 weeks of tuition; each week consisting of lectures, tutorials and in some subjects practical work done in laboratories or on site. During this time the student's progress is evaluated by means of tests and the presentation of projects and practical reports. At the end of each semester, final examinations are written over a 2 week period on all the work done during the semester.

Students can register as an Engineering Technician in Training with ECSA (The Engineering Council of South Africa), and once qualified, as a registered Engineering Technician. NB. The programmes offered by this department are fully accredited by ECSA.

3. Civil Engineering Fields

Transportation, Water, Structural, Geotechnical, Construction Management, Urban Engineering. Civil Engineering technicians could be involved with construction projects such as reinforced concrete, structural steel, timber and masonry structures, roads, bridges, dams, canals, pipelines, water purification, sewage treatment, airports, railways, harbours, housing and services.

4. Careers

The following selection of careers are available:

Design draughtsman, project official, site agent, municipal technician, engineering surveyor, quantity technician, designer, laboratory technician, contracts manager, project planner, estimator, quality controller, geotechnician.

4.1 Career Opportunities

There is ample opportunity to attain job satisfaction and attractive financial rewards. Some past students from this department have senior positions at consulting engineering firms, construction companies, government bodies, local authorities and industry. This career is accessible to men and women of all races.

5. Enquiries

Enquiries may be addressed to:

The Head of Department

Civil Engineering and Building - Block RE Building (3rd Floor)

Vaal University of Technology, Private Bag X021 VANDERBIJLPARK 1900

Tel: (016) 950-9241; Fax: (016) 950-9957 e-mail: rosaliat@vut.ac.za -website: www.vut.ac.za



Department: Industrial Engineering

Faculty: Engineering and Technology

Diploma: Engineering Industrial, B Tech Engineering: Industrial Engineering and

M Tech: Engineering Industrial

Hierarchy of Qualifications

Diploma in Industrial Engineering
 Baccalaureus Technologiae (B Tech)
 Advanced Diploma (not offered yet)
 Postgraduate Diploma (not offered yet)
 Magister Technologiae (M Tech)/ Masters of Engineering (MEng)

1. Admission Requirements:

Subjects	Diploma	
NSC Endorsements	Eligibility for Dip or B Tech Degree	
Compulsory Subjects		Note
		* 3 = 40-49%
Mathematics	4	* 4 = 50-59%
Physical Science	4	* 5 = 60-69%
English	4	* 6 = 70-79%
Total	3 x 4 = 12	* 7 = 80-89%
		* 8 = 90-99%
Any other 4 subjects with a minimum of 3	4 X 3 = 12	
Total	24	

Applicants with a National Certificate (Vocational) at NQF Level 4

National Certificate (Vocational)	Compulsory Subjects	Minimum	APS	%
				3 = 40 – 49%
	English		4	4 = 50 – 59%
	Mathematics		4	5 = 60 – 69 %
	Physical Sciences/ Applied Engineering Technology		4	6 = 70 – 79 %
	Any other three vocational subjects		5 x 3	7 = 80 – 89 %
				8 = 90 – 100%
	<i>Total</i>		27	

SC National Certificate	Senior	Compulsory Subjects	Minimum	
		English	4	3 = 40 – 49%
		Mathematics	4	4 = 50 – 59%
		Physical Science	4	5 = 60 – 69 %
		Any THREE other subjects excluding Life Orientation		6 = 70 – 79 %
			3 X3 = 09	7 = 80 – 89%
		<i>Total</i>		8 = 90 – 100 %
			21	

2. Programme Structure: Diploma: Engineering: Industrial

A diploma will be issued on the completion of five semester of university education) and one semesters Work Integrated Learning (WIL) at an accredited employer. The experiential training

3. Curriculum

Semester 1: Applied Communication Skills 1.1; Engineering Chemistry 1; Engineering Skills 1; ICT Skills 1; Mathematics 1; Physics 1; Social Intelligence 1.

Semester 2: Applied Communication Skills I.2; Computing Applications 2; Engineering Chemistry 2; Engineering Drawing 1; Mathematics 2; Physics 2; Safety Principles and Law 1; Manufacturing Relations 2.

Semester 3: Applied Communication Skills 2.1; Electrical engineering 1; Engineering Work Study 1; Manufacturing Engineering 1; Production Engineering 1; Qualitative Techniques 1; Mechanics 1.

Semester 4: Applied Communication Skills 2.2; Computer Aided Draughting 1*; Costing 2; Electrical Engineering 2*; Engineering Work Study 2; Facility Layout and Material Handling 2; Maintenance 1*; Mechanical Engineering Design 2*; Mechanical Manufacturing Engineering 2; Mechanics of Machines 2*; Production Engineering 2; Quality Assurance 2; Strength of Materials 2*. (* Electives – student have to do only 1)

Semester 5: Automation 3; Engineering Work Study 3; Industrial Accounting 3; Industrial Leadership 3; Mathematics 3; Operations Research 3.

Semester 6: Work Integrated Learning (Industrial)

BACCALAUREUS TECHNOLOGIAE (B TECH): INDUSTRIAL ENGINEERING

Programme Prerequisites

- (i) All applicants must have a Diploma or National Diploma with the proviso of a 60% performance in those diploma subjects that will carry forward into the B Tech qualification.

Programme Duration

Semester 1: Production Technology IV; Project Engineering IV; Project Research IV (year Programme); Systems Dynamics IV.

Semester 2: Logistics Engineering IV; Information Systems IV; Project Research IV, Quality Assurance IV; Entrepreneurship IV.

MASTER TECHNOLOGIAE (M Tech): ENGINEERING: INDUSTRIAL

Programme Prerequisites

- (i) A B Tech: Engineering: Industrial degree with Average of 60%.
- (ii) Students are required to attend a compulsory programme in research methodology

Programme Duration

- As this degree is mainly based on research, all candidates for the degree shall, within six months after registration, submit proof of the submission of a research proposal approved by the EXCO of Senate.
- Minimum duration is one year. Note: Guidelines for research projects are available from the Faculty of Engineering.

MASTERS OF ENGINEERING IN INDUSTRIAL ENGINEERING (MENG INDUSTRIAL)

Admission requirements: a BEng Degree or Equivalent level 8 qualification including the Postgraduate Diploma

Duration of Programme: The equivalent of 1-year full-time study.

Programme Structure: This instructional programme comprises of a thesis only.

4. What is Industrial Engineering

The main objective of this discipline is to constantly improve methods, procedures and practices within an organisation, in order to increase productivity and profits. Value is added if inputs like manpower, materials, machinery and money are converted more effectively into products and services by using sound management principles.

An Industrial Engineer is continually engaged in core aspects such as communication, cooperation, quality, planning and scheduling, as well as the calculation of cycle time, capacity and utilisation. Industrial Engineers should also be competent in economic analysis, problem solving, materials handling, facility layout etc.

Industrial Engineering therefore requires persons who like working with people; who enjoy analysing and solving problems, developing solutions, gaining co-operation and motivating people. Industrial engineers always seek better, quicker and cheaper ways of doing things.

5. Job Opportunities

There is a great need for persons who are well trained in Industrial Engineering. Job opportunities for business advisors, industrial analysts, production personnel, planning personnel and line managers are available in all types of manufacturing companies as well as in service organisations. Experience has shown that people with a qualification in Industrial Engineering and a dynamic personality, quickly progress to management level or start their own businesses.

6. Registration with ECSA

Registration with the Engineering Council of South Africa (ECSA) is possible. The following registration options are available:

- Registered Engineering Technician after completion of the Diploma.
- Registered Professional Technologist after completion of the B Tech degree with a minimum of three years industry experience.

7. Enquiries

Student Registration, Vaal University of Technology, Private Bag X021, Vanderbijlpark, 1900.

Further enquiries might be addressed to:

The Head of Department: Industrial Engineering and Operations Management

Vaal University of Technology, Private Bag X021, Vanderbijlpark, 1900

Tel: (016) 950 9287; Fax: (016) 950 9797; marisee@vut.ac.za; [website www.vut.ac.za](http://www.vut.ac.za)



Department: Operations Management

Faculty: Engineering and Technology

Department: Industrial Engineering & Operations Management

Diploma: Operations Management, B Tech: Operations Management

NOTE: The Diploma: Operations Management will only be offered from January 2017.

1. Hierarchy of Qualifications

Diploma: Operations Management – 3 years

Baccalaureus Technologiae (B Tech) - 1 year

2. Admission Requirements:

Subjects	Diploma	
NSC Endorsements	Eligibility for Dip or B Tech Degree	
Compulsory Subjects		Note
Mathematics	4	* 3 = 40-49%
Physical Science	4	* 4 = 50-59%
English	4	* 5 = 60-69%
Total	3 x 4 = 12	* 6 = 70-79%
		* 7 = 80-89%
		* 8 = 90-99%
Any other 4 subjects with a minimum of 3	4 X 3 = 12	
Total	24	

Applicants with a National Certificate (Vocational) at NQF Level 4

National Certificate (Vocational)	Compulsory Subjects	Minimum	APS	%
				3 = 40 – 49%
	English		4	4 = 50 – 59%
	Mathematics		4	5 = 60 – 69 %
	Physical Sciences/ Applied Engineering Technology		3	6 = 70 – 79 %
	Any other three vocational subjects		5 x 3	7 = 80 – 89 %
	<i>Total</i>		26	8 = 90 – 100%

Applicants with a Senior Certificate

SC National Certificate	Senior	Compulsory Subjects	Minimum	
				3 = 40 – 49
		English	4	4 = 50 – 59
		Mathematics	4	5 = 60 – 69
		Physical Science	3	6 = 70 – 79
		Any THREE other subjects excluding Life Orientation	3 X 3 = 09	7 = 80 – 89
		<i>Total</i>	20	8 = 90 – 100

3. Programme Structure: Diploma in Operations Management

A diploma will be issued on the completion of six semesters of university education.

4. Curriculum

Semester 1: Applied Communication Skills 1; ICT Skills 1; Manufacturing Technology 1; Organisational, Effectiveness 1.1; Work place Dynamics 1.1; Operations Management 1.1.

Semester 2: Applied Communication Skills 1.2; Organisational Effectiveness 1.2; Workplace Dynamics 1.2; Manufacturing Technology 1.2, Mathematics 1, Quality Management 1, Operations Management 1.2.

Semester 3: Applied Communication Skills 2.1; Costing and Estimating 1.1., Operations Management 2.1, Organisational Effectiveness 2.1, Quality Assurance 2, Statistics 1.1.

Semester 4: Applied Communication Skills 2.2; Costing and Estimating 1.2; *Engineering Chemistry 1; *Labour Law 1.1; Operations Management 2.2, Operations Management Techniques 2, Organisational Effectiveness 2.2, *Physics 1, *Programming 1. (Subjects with * in front is electives)

Semester 5: *Engineering Chemistry 2, Industrial leadership 3; *Maintenance Engineering 2; *Manufacturing Engineering 2; *Operations Management 3.1; Operations Management Techniques 3; Operations Management Technology 3; Organisational Effectiveness 3; *Physics 2, *Programming 2. (Subjects with * in front is electives)

Semester 6: Operations Management Practice 1.

BACCALAUREUS TECHNOLOGIAE (B TECH): OPERATIONS MANAGEMENT

Admission requirements

All applicants **must have a Diploma or National Diploma with the proviso of a 60% average.**

Programme Duration

A B. Tech: Operations Management degree will be awarded after successful completion of all ten subjects, which may be completed in one year.

Curriculum

Semester 1: Introduction to Marketing Management I (Module I); Operations Management IV (Module II); Financial Planning and Control III (Module I); Research Methodology I (Module I); Operations Management Techniques IV (Module I)

Semester 2: Introduction to Marketing Management I (Module II); Operations Management IV (Module II); Financial Planning and Control III (Module II); Research Methodology I (Module II); Operations Management Techniques IV (Module II)

5. What is Operations Management

If you are a person who likes working with people, who enjoys analyzing and solving problems, developing solutions, gaining co-operation, motivating people and who always seeks better, quicker and cheaper ways of doing things, then this is the Programme for you.

Qualified persons in Operations Management are employed by both manufacturing companies as well as service organizations

In Operations Management you will specialize in production scheduling, material movement, inventory control, quality management, work simplification, productivity improvement and will contribute to the design and implementation of integrated systems comprising capital, plant, manpower and raw materials. Your objective will be to constantly improve methods, procedures and practices within an organization in order to increase productivity and profits.

6. Job Opportunities

Operations Management offers a challenging and exciting career in the private sector. The expertise and skills that you will achieve find their optimum application and growth in the manufacturing industry, progressively, as Production Assistant / Production Planner, Production Scheduler / Head Planner, Production Superintendent, Production Manager and Operations Manager.

People with Operations Management qualifications and experience are also well equipped to start their own business.

7. Enquiries

Student Registration, Vaal University of Technology, Private Bag X021, Vanderbijlpark, 1900.

Further enquiries might be addressed to:

The Head of Department: Industrial Engineering and Operations Management

Vaal University of Technology, Private Bag X021, Vanderbijlpark, 1900

Tel: (016) 950 9287; Fax: (016) 950 9797; marisee@vut.ac.za; website www.vut.ac.za



Department: Mechanical Engineering
 Faculty: Engineering and Technology
 Diploma: Engineering Mechanical, B Tech: Engineering Mechanical, M Tech: Engineering Mechanical,
 MEng: Engineering Mechanical and D Tech: Engineering: Mechanical

Hierarchy of Qualifications

- Diploma in Mechanical Engineering
- Baccalaureus Technologiae (B Tech)
- Advanced Diploma
- Postgraduate Diploma
- Magister Technologiae (M Tech)/ Masters of Engineering (MEng)
- Doctor of Engineering in Mechanical Engineering (DEng)

1. Admission Requirements:

Subjects	Diploma	
NSC Endorsements	Eligibility for Dip or B Tech Degree	
Compulsory Subjects		Note * 3 = 40-49%
Mathematics	4	* 4 = 50-59%
Physical Science	4	* 5 = 60-69%
English	4	* 6 = 70-79%
Total	3 x 4 = 12	* 7 = 80-89%
		* 8 = 90-99%
Any other 4 subjects with a minimum of 3	4 X 3 = 12	
Total	24	

Applicants with a National Certificate (Vocational) at NQF Level 4

National Certificate (Vocational)	<u>Compulsory Subjects</u>	<u>Minimum</u>	<u>APS</u>	% 3 = 40 – 49%
	English		4	

	Mathematics	4	4 = 50 – 59%
	Physical Sciences/ Applied Engineering Technology	4	5 = 60 – 69 % 6 = 70 – 79 %
	Any other three vocational subjects	5 x 3	7 = 80 – 89 % 8 = 90 – 100%
	<i>Total</i>	27	

SC		<u>Compulsory Subjects</u>	<u>Minimum</u>	3 = 40 – 49%
National Certificate	Senior	English	4	4 = 50 – 59%
		Mathematics	4	5 = 60 – 69 %
		Physical Science	4	6 = 70 – 79 %
		Any THREE other subjects excluding Life Orientation	3 x 3 = 09	7 = 80 – 89 % 8 = 90 – 100 %
		<i>Total</i>	21	

Note: Scholars who do not qualify for the Diploma Programmes may apply for the extended diploma programmes. Tel: (016) 950-9589. For details on the pre diploma programmes see VUT website www.vut.ac.za

2. Programme Structure: Diploma

Six semesters University attendance.

The Vaal University of Technology is not responsible for providing opportunities for work integrated learning but will assist students in obtaining such opportunities. This Department offers the following fields of study in this programme:

Design and Electromechanical. All students are required to complete at least one of the two streams. Note that the medium of instruction is English.

2.1 Curriculum

Semester 1: Applied Communication Skills 1.1, Engineering Chemistry 1, Engineering Skills 1, ICT Skills 1, Mathematics 1, Physics 1, Social Intelligence 1

Semester 2: Applied Communication Skills 1.2, Computing Applications 2, Engineering Chemistry 2, Engineering Drawing 1, Mathematics 2, Physics 2, Safety Principles and Law 1

Semester 3: Mechanics 1, Project 1 (WIL Mechanical), Engineering Drawing 2, Mathematics 3, Applied Communication Skills 2.1, Mechanical Manufacturing Engineering 1, Electrical Engineering 1

Semester 4: *Mechanical Engineering Design 2, *Mechanics of Machines 2, *Strength of Materials 2, *Fluid Mechanics 2 (Mechanics), *Thermodynamics 2, *Project 2 (WIL Mechanical), * Applied Communication Skills 2.2, Computer Aided Draughting1

Semester 5: *Mechanics of Machines 3, *Strength of Materials 3, *Fluid Mechanics 3, *Thermodynamics 3, Mechanical Engineering Design 3, Manufacturing Engineering 2, Maintenance Engineering 1, *Project 3 (WIL Mechanical).

Semester 6: *Theory of Machines 3, *Applied Strength of Materials 3, *Hydraulic Machines 3, *Steam Plant 3, Machine Design 3, Maintenance Engineering 2, Modelling and Engineering Computation 2, *Experiential Learning 1 (Mechanical)

Baccalaureus Technologiae (B Tech) - Admission requirements

All applicants must have a Diploma or National Diploma ;with proviso of a 60% performance in those diploma subjects that will carry forward into the B Tech qualification, including 12 months' Work Integrated Learning where applicable.

*For the National Diploma, the following subjects shall be considered when calculating the required average: (i) Mathematics III, (ii) Hydraulic Machines III, (iii) Steam Plant III, (iv) Theory of Machines III, and (v) Applied strength of Materials III.

PROGRAMME DURATION: Minimum formal time is one-year full time or two years part-time.

SUBJECTS

Option 1: Technology

Engineering Design Project IV (Two semesters - enrolment in January), Strength of Materials IV, Stress Analysis IV, Mechanics of Machines IV, Automatic Control IV, Fluid Mechanics IV, and (Turbo Machines IV or Thermodynamics IV).

Option 2: Management

Engineering Design Project IV (Two semesters - enrolment in January) plus two of the following combinations:

Strength of Materials IV and Stress Analysis IV;

Mechanics of Machines IV and Automatic Control IV;

Fluid Mechanics IV and (Turbo Machines IV or Thermodynamics IV).

Plus the following subjects: Project Engineering IV and Entrepreneurship IV.

Masters of Engineering in Mechanical Engineering (MEng Mechanical)

Admission requirements: a BEng Degree or Equivalent level 8 qualification including the Postgraduate Diploma

Duration of Programme: The equivalent of 1 year full-time study.

Programme Structure: This instructional programme comprises of a thesis only.

Doctor of Engineering in Mechanical Engineering: (DEng Mechanical)

Admission requirements:

Magister Technologiae: Engineering: Mechanical or equivalent

Ad hoc cases will be treated on merit.

Duration of the programme: At least two years full time research, concluded with a Doctoral Thesis

Magister Technologiae (M Tech)

ADMISSION REQUIREMENTS: A minimum average of 60% must be achieved in Baccalaureus Technologiae. All students are required to attend a Programme in research methodology PROGRAMME DURATION: Minimum formal time is one year PROGRAMME STRUCTURE: A dissertation.

3. What does a Technician in Mechanical Engineering do?

A technician is a person in possession of at least the National Diploma in Engineering. The task of the technician in the design field is to assist the engineer/technologist with the design of new products or equipment for use in industry or society. A technician in the maintenance field must see to it that preventive or scheduled maintenance is done on all machines in order to prevent interruptions in production. The activities in Mechanical Engineering can therefore be grouped into design, maintenance, electromechanical and project work where the latter includes aspects such as planning of projects, cost control, evaluation of tenders, negotiations with contractors, control over the progress of the project, co-ordination of all the interested departments and commissioning of the completed project.

3.1 Who is a professional Technologist?

He/she is a person who has completed at least a B Tech degree, has the necessary practical experience and is registered with the Engineering Council of South Africa as a professional person. Such a person can perform work of an engineering nature prescribed by the Minister as the kind of work reserved for persons registered in terms of an Act of Parliament. This person can offer a consulting service in the field in which he/she has received the necessary academic and practical training.

3.2 What is the certificate of competency as Engineer?

The Certificate of Competency as a Mechanical and / or Electrical Engineer is issued by the Department of Labour (Factories) or the Department of Mineral and Energy Affairs (Mines) to a person with the necessary academic (diploma / degree) and practical experience who has passed a qualifying examination. A person with such a Certificate must take responsibility for the operation of a factory or mine where the consumption of electricity exceeds a certain limit. *This University of Technology is one of a few tertiary institutions which offers accredited Diplomas (by both Departments mentioned above) as preparation for the examination for this Certificate.*

4. Career opportunities

In any heavy or light manufacturing industry, e.g. the chemical industry, iron and steel manufacturing industry, mining industry, power stations, transport services, provincial and government services, etc. Technicians are much sought after and a career in this field is lucrative and rewarding.

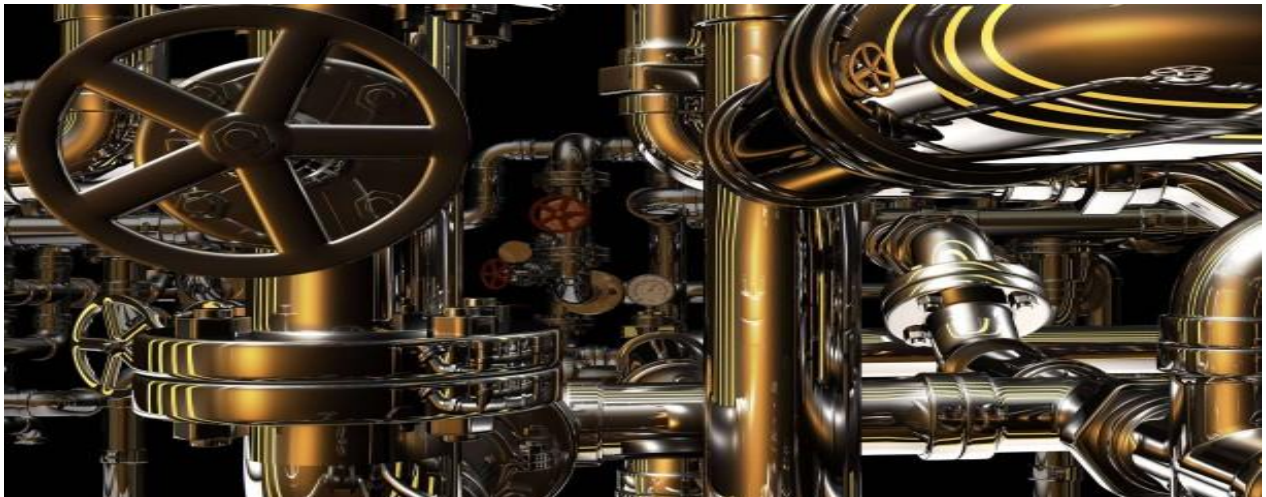
Enquiries Learner Registrations, Vaal University of Technology, Private Bag X021, VANDERBIJLPARK 1900

Further enquiries may be addressed to:

The Head: Department of Mechanical Engineering

Vaal University of Technology, Private Bag X021, VANDERBIJLPARK 1900

Tel: (016) 950-9287; Fax: (016) 950-9797 e-mail: marisee@vut.ac.za



Department: Metallurgical Engineering

Faculty: Engineering and Technology:

Diploma: Engineering Metallurgical,

B Tech: Engineering Metallurgical, M Tech: Engineering Metallurgical.

1. Admission Requirements:

Subjects	Diploma	
NSC Endorsements	Eligibility for Dip or B Tech Degree	
Compulsory Subjects		Note
Mathematics	4	* 3 = 40-49%
Physical Science	4	* 4 = 50-59%
English	4	* 5 = 60-69%
Total	3 x 4 = 12	* 6 = 70-79%
		* 7 = 80-89%
		* 8 = 90-99%
Any other 4 subjects with a minimum of 3	4 X 3 = 12	
Total	24	

Applicants with a National Certificate (Vocational) at NQF Level 4

National Certificate (Vocational)	Compulsory Subjects	Minimum	APS	%
				3 = 40 – 49%
	English		4	4 = 50 – 59%
	Mathematics		4	5 = 60 – 69 %
	Physical Sciences/ Applied Engineering Technology		4	6 = 70 – 79 %
	Any other three vocational subjects		5 x 3	7 = 80 – 89 %
	<i>Total</i>		27	8 = 90 – 100%

Applicant with a Senior Certificate

SC	Senior	Compulsory Subjects	Minimum	
National Certificate		English	4	3 = 40 – 49%
		Mathematics	4	4 = 50 – 59%
		Physical Science	4	5 = 60 – 69 %
		Any THREE other subjects excluding Life Orientation		6 = 70 – 79 %
		<i>Total</i>	3 X3 = 09	7 = 80 – 89 %
			21	8 = 90 – 100 %

Note: Scholars who do not qualify for the Diploma Programmes may apply for the extended programmes. Tel: (016) 950-9589. For details on the extended programmes see VUT website www.vut.ac.za

2. Diploma

Semester 1: Applied Communication Skills 1.1, Engineering Chemistry 1, Introduction to Engineering 1, Computing Application 1, Engineering Mathematics 1, Engineering Physics 1, Social Intelligence 1

Semester 2: Applied Communication Skills 1.2, Computing Applications 2, Engineering Chemistry 2, Engineering Drawing 1, Engineering Mathematics 2, Engineering Physics 2, Safety Principles and Law 1

Semester 3: Applied Communications Skills 2.1, Engineering Geology 1, Extractive Metallurgy 1, Manufacturing Metallurgy 1, Mineral Processing 1, Physical Metallurgy 1, Process Thermodynamics 1.

Semester 4: Applied Communication Skills 2.2, Hydrometallurgy 2, Manufacturing Metallurgy 2, Mineral Processing 2, Physical Metallurgy 2, Pyro-metallurgy 2, Quality Control 2

Semester 5: Environmental Chemistry 1, Hydrometallurgy 3, Management 1, Manufacturing Metallurgy 3, Mineral Processing 3, Physical Metallurgy 3, Pyro-metallurgy 3

Semester 6: Work-Integrated Learning (Metallurgy),

3. Baccalaureus Technologiae (B Tech) - Admission requirements

All applicants must have a Diploma or National Diploma including 12 months Work Integrated Learning.

This Programme is offered from January to November, on Fridays (1 year). The Programme consists of a year-long project plus a minimum of three subjects from the options listed below.

3.1 Curriculum

SEMESTER	SUBJECTS		
	PHYSICAL	HYDRO	PYRO
1&2	EYMPR4A (Project)	EYMPR4A (Project)	EYMPR4A (Project)
1	AMISS3C (Mathematics 3)	AMISS3C (Mathematics 3)	AMISS3C (Mathematics 3)
1	EYMMW3A (Metallurgical Thermodynamics)	EYMMW3A (Metallurgical Thermodynamics)	EYMMW3A (Metallurgical Thermodynamics)
1	EYMF4A (Physical Metallurgy)	EYMN4A (Applied Mineral Processing 4)	EYMN4A (Applied Mineral Processing 4)
2	EYMMI4A (Materials Deformation Technology 4)	EYMEC4A (Extraction of Non-ferrous Metals 4)	EYMYA4A (Production of Iron and Steel 4)
2	EYMKR4A (Corrosion 4)	EYMN3A (Mineralogy 3)	EYMKR4A (Corrosion 4)

4. M Tech

B Tech or equivalent:

This is a purely research qualification. The student should prove that he/she has passed an approved Programme in research methodology. The entrance requirement is a relevant B Tech or equivalent.

4.1 Masters of Engineering in Metallurgical Engineering (MEng Metallurgy)

Admission requirements: a BEng Degree or Equivalent level 8 qualification including the Postgraduate Diploma

Duration of Programme: The equivalent of 1 year full-time study.

Programme Structure: This instructional programme comprises of a thesis only.

5. What are the functions of the Metallurgical Technician?

He/she will be involved in:

Developing new processes/procedures in the extraction/manufacturing industry as well as optimising/improving existing processes; ensuring the quality of products during the different stages of the process; testing and inspection of the final material/product.

6. Career Opportunities

Many opportunities exist at primary producers of both ferrous and non-ferrous metals as well as in the manufacturing industry.

Enquiries may be addressed to:

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