Department: Biotechnology

Diploma: Biotechnology
3 Year course
Advanced Diploma: Biotechnology (1 Year course- Full Time)
Postgraduate Diploma: Biotechnology (1 Year course- Full Time)
Master of Applied Science in Biotechnology (by research)
PhD: Biotechnology (by research)

DIPLOMA: BIOTECHNOLOGY

1. Admission Requirements:

Subjects	Dip: Biotechnology	
NSC endorsement	Eligibility for Diploma	
Compulsory subjects		Notes
English Mathematics Physical Science Life Science	4 4 4 4	3=40-49% 4=50-59% 5=60-69% 6=70-79% 7=80-89% 8=90-99%
Life Orientation	Max 3	
Any other 2 subjects	7	
Total	26	

2. Curriculum

Year 1	
Semester 1	**Semester 2**
Microbiology I (Practical and Theory)	Microbiology II (Practical and Theory)
Chemistry I	Biochemistry II (Practical and Theory)
Biodiversity and Ecology	Analytical Chemistry: Biological II
Calculations & Statistics I	Disease & Immune Response II
Applied Communication Skills 1 (Model 1)	Applied Communication Skills 1 (Module II)
	ICT Skills I
Year 2	
Semester 3	**Semester 4**
Microbiology III (Practical and Theory)	Food Microbiology III (Practical and Theory)
Introductory Genetics II	Analytical Biochemistry III
Microbial Biochemistry III (Practical and Theory)	Quality Assurance I (Biological)
Fermentation Technology II (Practical and Theory)	Bioprocessing III (Practical and Theory)
Applied Communication Skills II (Module I)	Applied Communication Skills II (Module II)
	Entrepreneurship
Year 3	
Semester 5	**Semester 6**
Biotechnology Laboratory Practice I	Biotechnology Laboratory Practice II

ADVANCED DIPLOMA

Diploma in Biotechnology (60%) or equivalent.

Semester 1	**Semester 2**
Green Biotechnology	Laboratory Management and Compliance
Molecular Biotechnology	White Biotechnology
Research Methodology	Advanced Microbial Biochemistry
Biotechniques (Year Course)	Biotechniques (Year Course)

POSTGRADUATE DIPLOMA

Advanced Diploma in Biotechnology (60%) or equivalent.

Semester 1	**Semester 2**
Advanced Molecular Biology	Bioinformatics Module I
Bioinformatics Module I	Biostatistics
Biostatistics Module I	Advanced Biotechnology Module II
Advanced Biotechnology Module I	Research Project (Year Course)
Research Project (Year Course)	

MASTER OF APPLIED SCIENCE IN BIOTECHNOLOGY (*By Research)*

Postgraduate Diploma in Biotechnology (60%) or equivalent

PHD: BIOTECHNOLOGY (*By Research)*

Master of Applied Science in Biotechnology or equivalent.

3. What are the functions of a Microbiologist/Biotechnologist?

Quality control in enterprises such as the following: water purification plants, food processing factories, dairies, pharmaceutical factories, sewerage plants, etc. Liaise with chemical engineers and technicians in the fermentation and biotechnology industries.

4. Career opportunities

A career as a Microbiologist / Biotechnologist offers challenging and exciting opportunities including quality control in enterprises such as: water purification plants, food processing factories, dairies, pharmaceutical factories, sewerage plants, etc. There is a demand for trained Microbiologists / Biotechnologists in industrial, research and academic settings.

Entry level : Laboratory Assistant

Middle level : Laboratory Technician

Top level : Laboratory Manager

Research opportunities are available at academic, industrial and research institutions

5. Enquiries

Enquiries may be addressed to:
Head: Department of Biotechnology
Faculty of Applied and Computer Sciences
Vaal University of Technology
Private Bag X021
VANDERBIJLPARK
1900

Administrator: Ms N Lieketseng
Tel: (016) 950 9648
Fax: (016) 950-9794
E-mail: lieketsengn@vut.ac.za
Website: www.vut.ac.za

Department: Chemistry
Diploma: Analytical Chemistry
3 Year Course
Advanced Diploma in Chemistry (1 Year Full Time)
MAPPSc: Chemistry
PhD: Chemistry

DIPLOMA: ANALYTICAL CHEMISTRY

1. Admission Requirements:

Subjects	Diploma: Analytical Chemistry	D11500
NSC endorsement	Eligibility for Diploma	
Compulsory subjects		Notes
English Mathematics Physical Science	4 4 4	3=40-49% 4=50-59% 5=60-69% 6=70-79% 7=80-89% 8=90-99%
Life Orientation	Max 3	
Any other 3 subjects	11	
Total	26	

2. Curriculum

Year 1	
Semester 1	**Semester 2**
Chemistry I	Analytical Chemistry I
Physics I Applied	Analytical Chemistry Practical I
Mathematics 1 Applied	Inorganic Chemistry II
Applied Communication skills I	Mathematics II
ICT skills I	Organic Chemistry II
EDL I	
Year 2	
Semester 3	**Semester 4**
Analytical Chemistry II	Analytical Chemistry III
Analytical Chemistry Practical II	Analytical Chemistry Practical III
Physical Chemistry II	Physical Chemistry III
Organic Chemistry III	Chemical Quality Assurance III
Inorganic Chemistry III	
Year 3	
Semester 5	**Semester 6**
Chemical Process Industries II	Chemical Project PII or
Physics Theory II	Chemical Industry Practical I
Physics Practical II	
Entrepreneurship I	
Applied Communication skills I Module II	
Industrial Chemical Analysis I	
OR	
Chemical Industry Practical I PI	

ADVANCED DIPLOMA

Diploma in Chemistry 60% in Analytical Chemistry 3 Theory & Practical, Chemical Quality Assurance, Mathematics 2 Chemical Industrial 1 or S5 Subjects and Chemistry project II

Semester 1	Semester 2
Analytical Chemistry IV	Inorganic Chemistry IV
Physical Chemistry IV	Organic Chemistry IV
Research Methodology in Chemistry	Introduction to Chemistry Project

MAPPSc: CHEMISTRY

Research Project by dissertation. Admission Requirements: B Tech Chemistry/BSc. Hons Chemistry/Postgraduate Diploma in Chemistry or equivalent with an average of 60%.

PhD: CHEMISTRY

Research project by thesis. Admission Requirements: M Tech/MSc (Chemistry) or equivalent.

3. What are the functions of an Analytical Chemistry Technician?

Analysis of samples by the wet methods or using analytical instruments, writing reports on analysis, developing methods for analysis, writing requisitions for purchasing instrumentation, managing of a laboratory.

4. Career Opportunities

A career in chemistry offers challenging and exciting opportunities in both the private and public sectors. There is a continuous demand for trained analytical technicians. Position on entry level: Laboratory assistant. Middle level: Laboratory technician. Top level: Laboratory manager. Researchers and development of scientific opportunities that exist in the Science councils. Opportunities also exist in the academic environment to become lectures and professors.

5. Enquiries

Enquiries may be addressed to:
Head of Department: Chemistry
Faculty of Applied and Computer Sciences
Vaal University of Technology
Private Bag X021
VANDERBIJLPARK
1900

Administrator: Ms N Lieketseng
Tel: (016) 950 9648
Fax: (016) 950-9794
E-mail: lieketsengn@vut.ac.za
Website: www.vut.ac.za

Department: Health Sciences
Degree: Bachelor of Health Sciences in Medical Laboratory Sciences (BHSc: MLS)
4 Year Course
Advanced Diploma in Biomedical Technology (1 Year Full Time)
Postgraduate Diploma in Biomedical Technology (1 Year Full Time)

DEGREE: BACHELOR OF HEALTH SCIENCES IN MEDICAL LABORATORY SCIENCES (BHSC: MLS) 4 YEAR COURSE

1. Admission Requirements

The student will have the first five semesters of class attendance at the University followed by three semesters of clinical practice in a laboratory approved for training purposes by Health Professions Council of South Africa (HPCSA). In the last two semesters of Clinical practice, the student will select an area of specialization. Students must pass a National Board Examination in their area of specialization before they graduate.

Qualification	**Bachelor of Health Science: Medical Laboratory Sciences**			
NSC endorsement	Eligibility for a Bachelor degree			
Compulsory subjects or equivalent (Standard or Higher grade system)	NSC Minimum points	Higher grade	Standard grade	Rating codes
English Mathematics Physical Science Life Science/Biology	4 4 4 5	D D D D	C C C C	3=40-49% 4=50-59% 5=60-69% 6=70-79% 7=80-89% 8=90-90%
Life Orientation	Max 3			
Any other 2 subjects	10			
	No Math Literacy			
Total	30			

Additional Entry Requirements: Applicants may be required to have industrial knowledge (i.e. job shadowing) and may undergo placement testing

2. Curriculum

Year 1	
Semester 1	**Semester 2**
Human Anatomy, Physiology & Disease I Module I	Introduction to Medical Laboratory Sciences I Module II
Introduction to Medical Laboratory Sciences I Module I	Human Anatomy, Physiology & Disease I Module II
Health Chemistry I	Computer Skills I
Health Physics I	Cell Biology I
Biostatistics I	Immunology I
	Introduction to Medical Laboratory Sciences I Module II
Year 2	
Semester 3	**Semester 4**
Clinical Chemistry II Module I	Clinical Chemistry II Module II
Microbiology II Module I	Microbiology II Module II
Haematology II Module I	Hematology II Module II
Immunohaematology II	Cytology II
Histology II	Clinical Chemistry II Module II

Year 3	
Semester 5	**Semester 6**
Clinical Chemistry III	Integrative Medical Laboratory Sciences III. Module II(Clinical Practice)
Microbiology III	Research Methods III
Haematology III	
Cytology III	
Integrative Medical Laboratory Sciences Theory III Module I	
Clinical Chemistry III	
Microbiology III	
Year 4	
Semester 7	**Semester 8**
Research Project IV Clinical Practise (students must choose one from the following specialisation)	
Laboratory Management IV	
Clinical Chemistry IV	
Microbiology IV	
Haematology IV	
Immunohaematology IV	
Cytology IV	
Histology IV	
Immunology IV	
Virology IV	
Forensic Sciences IV	
Pharmacology IV	
Cytogenetics IV	
Clinical Pathology IV	

ADVANCED DIPLOMA

Diploma in Biomedical Technology with 60%average in Microbiology III, Chemical Pathology III, Cellular Pathology III and Haematology III.

Semester 1	**Semester 2**
Research methodology in Biomedical Technology	Medical Laboratory Management Module II
Medical Laboratory Management Module I	
Genetics Module I	Genetics Module II
Choose one elective subject from the list below: Advanced Chemical Pathology module I Advanced Cytogenetics Module I Advanced Haematology Module I Advanced Immunology Module I Advanced Medical Microbiology Module I Advanced Histology Module I Advanced Cytology Module I Advanced Virology Module I Forensic Technology Module I Marketing in Health Science Module I Pharmacology Module I Education and Training in Health Sciences Module I	**Choose one elective subject from the list below:** Advanced Chemical Pathology module II Advanced Cytogenetics Module II Advanced Haematology Module II Advanced Immunology Module II Advanced Medical Microbiology Module II Advanced Histology Module II Advanced Cytology Module II Advanced Virology Module II Forensic Technology Module II Marketing in Health Science Module II Pharmacology Module II Education and Training in Health Sciences Module II

POSTGRADUATE DIPLOMA: BIOMEDICAL TECHNOLOGY
Advanced Diploma in Biomedical Technology (60%) or equivalent.

Semester 1	**Semester 2**
Epidemiology and Biostatistics	Management in Biomedical environment
Integrated Pathophysiology	Advanced Molecular Biology
Advanced Molecular Biology	Research Project in Medical Laboratory Sciences
Research Project in Medical Laboratory Sciences	

3. What are the functions of a Medical Laboratory Scientist?

Qualified medical laboratory scientists are specialized health professionals who play an integral role in the healthcare of society by providing vital information about a patient's state of health. Their input is necessary in the diagnosis, monitoring and treatment of diseases. They diagnose chemical, blood, immunologic, tissue, cellular disorders and also the presence of microorganisms that cause diseases. They analyze human specimens such as blood, urine, sputum, stool, cerebrospinal fluid (CSF), peritoneal fluid, pericardial fluid, and synovial fluid, and more other specimens.

4. Career Opportunities

The analytical and diagnostic services provided by medical laboratory scientists require a strong scientific knowledge, as well as trained reasoning ability and empathy for humanity. Career opportunities exists in a variety of laboratory settings including national laboratories within hospital settings, private clinical laboratories, blood banking institutions, research, biotechnology, forensic, and reference laboratories.

5. Registration with Professional Board

On enrolment, it is mandatory that each student registers with the Health Professionals Council of South Africa (HPCSA) as a student Medical Laboratory Scientist as per regulations set out in the Government Gazette (Circular E2/a9/2, 79, 09, 28). Successful completion of this qualification will entitle the student to register with the Health Professions Council of South Africa (HPCSA) as a qualified Medical Laboratory Scientist.

6. Enquiries

Enquiries may be addressed to:
Head: Department of Health Sciences
Faculty: Applied and Computer Sciences
Vaal University of Technology
Private Bag X021
VANDERBIJLPARK
1900

Administrator: Mr N Mokoena
Tel: (016) 950-7592
E-mail: ntsanem@vut.ac.za
website: www.vut.ac.za

Department: Information and Communication Technology
Diploma: Information Technology (3 year - Full time)
Advanced Diploma Information Technology (1year – Full time)
M.Tech: Information Technology (2-3 years - Part time)
D.Tech: Information Systems (2-4 years - Part time).

DIPLOMA: INFORMATION TECHNOLOGY

1. Admission requirements

Qualification		Information Technology			
NSC endorsement		(Diploma pass required)			
Compulsory Subjects	Score	Additional Compulsory subjects	Other Subjects	Minimum APS required	Bonus Points
English Mathematics or Technical Mathematics	4 4	None	Four other subjects totalling 16	24	Mathematics English or Natural Sciences
English Mathematical Literacy	4 6		Four other subjects totalling 16	26	Mathematics English or Natural Sciences

A maximum of 6 subjects are taken into consideration when calculating the total APS score, excluding Life Orientation.

2.Curriculum

Two Information Technology specialisation fields are offered: Business Applications & Development Software.

Development Software		
Year 1	Year 2	Year 3
Information Systems I Systems Software I Development Software I Programming Logic I Accounting Skills I Information Technology Skills I Applied Communication I	Information Systems II Development Software II Business Analysis II Systems Software II Web Management II Applied Communication II	Development Software III Business Analysis III
Business Applications		
Year 1	Year 2	Year 3
Information Systems I Systems Software I Development Software I Programming Logic I Accounting Skills I Information Technology Skills I Applied Communication	Information Systems II Development Software II Business Analysis II Systems Software II Web Management II Applied Communication II	Information Systems III Business Analysis III

ADVANCED DIPLOMA: AD: IT

The Advanced Diploma: IT is offered only at the Vanderbijlpark campus. It is offered on a full-time basis; therefore, students are required to take a full load of subjects. The minimum duration is one year. Ten modules must be completed. One elective subject is chosen per semester. In the case of Networks, if chosen, this will be the chosen elective for both semesters 1 and 2.

NB: It is imperative that students wishing to apply for Advanced Diploma: Information Technology, have an average of 60% for their final year subjects in their previous qualification.

Admission Requirements:

Diploma: Information Technology or equivalent relevant NQF level 6 360 credit qualification.
60% Average on all third-year subjects
(Ad hoc cases will be treated on merit).

Semester 1	Semester 2
Emerging Technologies (Compulsory)	Research Methodology (Compulsory)
Statistics for IT (Compulsory)	Advanced Databases (Compulsory)
IT Management (Compulsory)	User Experience Design (Compulsory)
Advanced Software Design (Elective)	IT Auditing (Elective)
Computer Security (Elective)	Artificial Intelligence (Elective)
Networks (Elective) in Semester 1 and 2	

* **Credits**
120 credits on NQF level 7

POST GRADUATE DIPLOMA: PG IT

The Post Graduate: IT is offered only at the Vanderbijlpark campus. It is offered on a full-time basis, therefore only during the day. The minimum duration is one year. Six modules must be completed.

Admission Requirements:
Advanced Diploma: Information Technology or equivalent relevant NQF level 7, 120 credit qualification (Ad hoc cases will be treated on merit).

Semester 1	Semester 2
Advanced supportive techniques and technologies	Strategic Business Analysis
Business Intelligence	Database Administration
Software Engineering	Research Project in Information systems and Technology

***Credits**
120 credits on NQF level 8

MAGISTER OF SCIENCE IN INFORMATION AND COMMUNICATION TECHNOLOGY (MICT)

Admission requirements:
NQF level 8 related qualification with a minimum of 120 credits or equivalent with research methodology as a prerequisite with a 60% average for all subjects
(Ad hoc cases will be treated on merit)
Duration: Minimum 2 years, maximum 3 years part time study.

Curriculum
Research project by dissertation
Credits
180 credits on NQF level 9

DOCTOT PHILOSOPHIAE IN INFORMATION AND COMMUNICATION TECHNOLOGY: PhD: ICT

Admission requirements:
NQF level 9 related qualification with a minimum of 180 credits or equivalent with a 60% average (Ad hoc cases will be treated on merit)
Duration of course:
Minimum 2 years, maximum 4 years part time study.

Curriculum:
Research project and thesis
Credits
360 edits on NQF level 10

Work Integrated Learning
The IT Diploma does not have a formal Work Integrated Learning component.

3. What does the IT specialist do?

The person will find himself/herself in any of a wide variety of computerised environments. Responsibilities may include the maintenance of systems in use, systems analysis and design and/or programming of new systems, network administration, database administration and user support. The computer specialist communicates with management and the different users of the systems, which make the position an important link in the global set-up of the organisation. Management of IT functions is a possible position in the career development of the keen IT specialist.

4. Career opportunities

Computerisation of most facets of modern society creates a multitude of possibilities. In-service training includes the development of prototypes or systems and/or the supervised support of existing systems. The typical entry level is that of programmer with a quick advance to the level of senior programmer. Further promotions are to the level of Systems Analyst, Network Administrator or Database Administrator.

5. Career status

IT specialists can acquire membership of the Computer Society of South Africa.

6. Enquiries

Enquiries may be addressed to:
Head: Department: Information and Communication Technology
Faculty of Applied and Computer Sciences
Vaal University of Technology
Private Bag X021
VANDERBIJLPARK
1900

Administrator:	Ms T Rikhotso
Tel:	(016) 950 9605
Fax:	(016) 950 9793
E-mail:	tiyiselamir@vut.ac.za
Website:	www.vut.ac.za

Department: Non-Destructive Testing & Physics
Diploma: Non-Destructive Testing
3 Year Course
Advanced Diploma: Non-Destructive Testing (1 Year -Full Time)

DIPLOMA: NON-DESTRUCTIVE TESTING

1. Admission Requirements:

Subjects	Dip: Non-Destructive Testing	
NSC endorsement	Eligibility for Diploma	
Compulsory subjects		Notes
English Mathematics Physical Science	4 4 4	3=40-49% 4=50-59% 5=60-69% 6=70-79% 7=80-89% 8=90-99%
Life Orientation	Max 3	
Any other 3 subjects	12	
Total	27	

2. Curriculum

Year 1	
Semester 1	**Semester 2**
Chemistry I	Mathematics II
Mathematics I	Physics II (Theory)
Physics I	Physics II (Practical)
Applied Communication Skills I. I	Engineering Drawing I
ICT Skills I	Penetrant Testing II (Theory)
Introduction to NDT I (Theory)	Penetrant Testing II (Practical)
Introduction to NDT I (Practical)	Radiographic Testing II (Theory)
	Radiographic Testing II (Practical)
	Applied Communication Skills I. II
Year 2	
Semester 3	**Semester 4**
Magnetic Particle Testing (Theory)	Advanced Ultrasonic Testing (Theory)
Magnetic Particle Testing (Practical)	Advanced Ultrasonic Testing (Practical)
Ultrasonic Testing (Theory)	Eddy Current Testing (Theory)
Ultrasonic Testing (Practical)	Eddy Current Testing (Practical)
Introduction to Fracture Mechanics	Quality Assurance
Metallurgy for NDT I	Entrepreneurship I
	Metallurgy for NDT II
Year 3	
Semester 5	**Semester 6**
Advanced Radiographic Testing (Theory)	Work Integrated Learning (NDT)
Advanced Radiographic Testing (Practical)	
Advanced Eddy Current Testing (Theory)	
Advanced Eddy Current Testing (Practical)	
Signal Processing	
Project (Numerical Analysis)	

ADVANCED DIPLOMA

Diploma in NDT with an average of 55% from all S4 subjects including Fracture Mechanics or
Diploma in NDT with an average of 55% from all S5 subjects including Advanced Methods of NDT (Theory & Practical) and Introduction to Fracture Mechanics or
Diploma in Metallurgical Engineering, Mechanical Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering with an average of 60% from all S4 or S5 subjects or
Bachelor's Degree in Physics, Mathematics and Chemistry with an average of 60% from all final year subjects including Mathematics II and Physics II in case where they are not major subjects

Semester 1	**Semester 2**
Ultrasonic Testing Techniques IV	Radiographic Testing Techniques IV
Fracture Mechanics IV	Electromagnetic Testing Techniques IV
Numerical Analysis with Matlab Applications IV	Corrosion Inspection & Monitoring Techniques IV
Research Methodology IV	Thermographic Testing Techniques IV
Optical Testing Methods IV (Elective Module)	NDT Project IV
Penetrant Testing Methods IV (Elective Module)	
Acoustic Emission Testing Methods IV (Elective Module)	

3. Career Opportunities

NDT Technicians: Perform inspections, monitoring, evaluations using non-destructive methods and quality assessment techniques. This is achieved through both fabrication and maintenance inspections conducted in accordance with regulatory requirements (codes and specifications). The technician can be part of an NDT department or unit within a company or as an independent service provider.

NDT Engineers: Being part of a team involved in project development including design, fabrication and specifying inspection techniques and methods to be used to ensure product safety, reliability and longevity.

NDT Research and Development Professionals: Working on improving the reliability of inspection methods and techniques. Further developing new techniques to inspect the improved materials and products utilised in the industry.

4. Enquiries

Enquiries may be addressed to:
Head: Department of Physics & Non-Destructive Testing
Faculty of Applied and Computer Sciences
Vaal University of Technology
Private Bag X021
VANDERBIJLPARK
1900

Administrator: Vacant
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